SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

This section of the EIS describes the potential impacts, beneficial and adverse, of the proposed action and other viable alternatives on the human and natural environment. An impact (consequence or effect) is defined as a modification to the human or natural environment that would result from the implementation of an action. The impacts can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action (secondary, indirect, or synergistic effects). The effects can be temporary (short-term), long lasting (long-term), or permanent. For purposes of this EIS, temporary effects are defined as those that would last up to five years after completion of the action. Long-term impacts are defined as those that would last five or more years.

Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. The significance of the impacts presented in this EIS is based upon existing regulatory standards, scientific and environmental knowledge, and/or best professional opinions of the authors of the EIS. The significance of the impacts on each resource will be described as either significant, insignificant (or negligible), or no impact. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR 1500-1508) and should receive the greatest attention in the decision-making process.

The following discussions describe and, where possible, quantify the potential effects of each viable alternative on the resources within or near the project area. These discussions are presented in the same sequential order as they appeared in Chapter 3 for each alternative carried forward for analysis.

4.1 NO ACTION ALTERNATIVE

The No Action Alternative would allow completion of the Border Infrastructure System in Areas II, III, and IV. No new or additional projects would be implemented in the remaining portions of the project corridor.

The direct impacts associated with the completion of all ongoing construction projects in Areas II, III, and IV have been previously addressed in the following NEPA documents:

- *Record of Environmental Consideration: Multi-tiered Pilot Fence Phase I, U.S. – Mexican Border, San Diego County, California, October 1996.*

Although many names have been used for this project from its inception as a pilot project to present, the official name is *San Diego 14-Mile Border Infrastructure System*.

- *Final Revised Environmental Assessment for the Immigration and Naturalization Service Multi-tiered Pilot Fence Project (Phase IA & IIA), San Diego County, California* (1997).

- *Final Environmental Assessment: Area Lighting, Fencing, and Roadways at International Border San Diego, California* (1997).

- *Final Environmental Assessment for Construction of Barrier Systems along a 1.6-Mile Corridor of the United States/Mexico International Boundary (Spring Canyon) in San Diego, California* (1998).

The following discussions will summarize the impacts presented in these EAs, and address the potential indirect effects of construction of this portion of the project only.

4.1.1 Geology

Implementation of the No Action Alternative would not result in additional direct effects to the area's geologic features in Areas I, V, and VI. The construction activities that are completed or still ongoing in Areas II, III, and IV have altered the topography in a couple of areas along the project corridor. Construction in the Spring Canyon area required cut-and-fill activities that moved over 1.25 million cubic yards of material. Similar activities at Johnny Wolf Creek are required, but at a much reduced magnitude. These activities have created a more level, gently sloping corridor than the natural state. Indirect effects have occurred at Spring Canyon when landslides jeopardized the slope's integrity and thus the road and fence platform. Klienfelder (1999a, b) reported that the construction activities associated with the Border Infrastructure System did not cause the initiation of the reactivation of the landslide, although the fill activities were considered to add to the movement. A copy of Klienfelder's (1999b) report is included in Appendix G. These landslides were corrected using an earthen buttress and slurry walls. However, about seven additional acres were required to be incorporated into the project footprint to correct the situation. These designs and other engineering considerations have been incorporated into the design and plans of the remaining portions of the Border Infrastructure System under the other action alternatives.

The No Action Alternative would require that USBP agents continue to use unimproved roads, as well as off-road areas, in Areas I, V, and VI. This continued use would increase erosional rates, which, over long-term periods, would affect geologic features. Areas such as Smuggler's Gulch, Goat Canyon, and Lichty Mesa would be particularly vulnerable due to the highly erodible soils (e.g., terrace escarpments) and steep slopes that occur in these areas.

4.1.2 Soils

About 170 acres of soils within the project Areas II, III, and IV have been directly disturbed by ongoing construction activities under the No Action Alternative. There is a potential for increased soil erosion during construction due to an increase in surface runoff; however, runoff has been captured by storm drainage, minimizing the potential for soil erosion. In addition, compaction techniques and erosion control measures such as waterbars, gabions, straw bales, and re-seeding were implemented to alleviate these situations. The construction activities must also comply with the Storm water Pollution Prevention Program (SWPPP) that was developed for these activities.

Soils and associated terrain in Areas I, V, and VI would remain in the existing condition under the implementation of the No Action Alternative. However, if the No Action Alternative is implemented it is likely that illegal trans-border traffic within these areas would increase due to redirection of those illegal activities around the completed sections of the Border Infrastructure System in Areas II, III, and IV. Uncontrolled and illegal foot and vehicle traffic in these areas would increase soil erosion and sedimentation rates.

4.1.3 Land Use

Implementation of the No Action Alternative has changed land use in Areas II, III, and IV from previous land uses (i.e., vacant, not graded land; and open space reserves) to the Border Infrastructure System. The approximate land use acres impacted in Areas II, III, and IV are shown in Table 4-1. As can be seen from this table, most of the land affected under this alternative is considered vacant.

Table 4-1. Land Use Acres Impacted in Areas II, III, and IV under the No Action Alternative

Land Use	Impact (Acres)
Spaced Rural Residential	2
Warehousing & Public Storage	7
Wholesale Trade	2
Field Crops	16
Vacant, Not Graded Land	127
Under Construction	16
TOTAL	170

In Areas I, V, and VI indirect impacts to land use would occur as these areas would continue to be utilized by USBP for daily operations. With the implementation of the No Action Alternative, USBP enforcement strategies would need to be expanded in Areas I, V, and VI in order to curtail illegal traffic crossing the international border. Increased enforcement would result in additional areas being required to support daily operations of USBP (i.e., more patrol roads, and observation points). Land use would be indirectly impacted by illegal traffic trampling vegetation, brush clearing, trash being left behind, and fires accidentally or intentionally caused by illegal aliens.

Within three miles of the border, over 60 miles of roads are currently used in the Spring Canyon area alone. Most (about 37 miles) of these roads could be abandoned upon completion of the Border Infrastructure System in Areas II, III, and IV. However, under the No Action Alternative, existing patrol roads would still be required north of the project footprint to control illegal traffic that circumvents either end of the Border Infrastructure System. Therefore, restoration of these roads would not be conducted and no beneficial impacts such as improved aesthetics nor enhancement of habitat for wildlife would result from this alternative.

4.1.4 Fish and Wildlife Resources

4.1.4.1 Vegetation Communities

Approximately 170 acres have been or will be impacted by the construction of the Border Infrastructure System in Areas II, III, and IV. This includes impacts associated with the construction in the eastern end of Area II, which has recently been initiated. Most (86 percent) of these communities were classified as disturbed habitat, urban/developed lands, and extensive pasture lands. Another 7 percent was classified as non-native grassland.

Indirect beneficial and adverse impacts would result under the No Action Alternative. Areas immediately north of the Border Infrastructure System would be protected from illegal traffic; thus, USBP off-road enforcement actions would be significantly reduced and impacts to extant vegetation virtually eliminated.

The magnitude of these beneficial effects will depend upon the amount of commercial and private development that occurs as the area becomes more secure from illegal traffic. Much of the higher quality vegetation communities lie within the Spring Canyon area and have been designated as MSCP lands. Therefore, development in this area is not expected to occur and the habitats in this area would substantially benefit from the reduction in illegal and enforcement traffic.

Under the No Action Alternative, indirect adverse impacts to vegetation would occur in Areas I, V, and VI due to illegal aliens and smugglers attempting to enter the United States in the non-protected areas. As the illegal entrants circumvent the Border

Infrastructure System, the USBP agents would be forced to increase the intensity of their efforts and enlarge the enforcement footprint. This alternative would result in similar numbers of illegal entrants attempting to escape into a smaller area due to the physical constraints and the lack of urban and natural concealment opportunities in Area I. The majority of these illegal attempts are expected to occur within Areas V and VI. As the entry attempts and enforcement activities increase, the vegetation communities within Smuggler's Gulch, Goat Canyon, and the Tijuana estuary would continue to be adversely impacted.

The USBP currently uses about 45 miles of unimproved patrol roads in Areas I, V, and VI within three miles of the border. These roads would continue to be used under the No Action Alternative. Furthermore, as illegal entry attempts continue or increase, additional roads could be created.

4.1.4.2 Wildlife

Because of the urban development and past land uses that have occurred on both sides of the border, the project corridor supports limited wildlife populations. The majority of the wildlife represented includes birds, some rodents, and invertebrates. Implementation of the No Action Alternative would not have direct effects on wildlife populations, as most of the construction that would affect wildlife habitat and population has been completed.

Indirect effects would occur, however, due to changes in habitat quality and quantity immediately north of the Border Infrastructure System throughout Areas II, III, and IV. Concomitant effects to wildlife populations would be in line with the beneficial or adverse impacts to their habitats. For example, protection of the Spring Canyon area and reduction in USBP patrol and enforcement activities would increase the quality and quantity of habitats in this region, which, in turn, would enhance wildlife population numbers and diversity. Contrarily, as the number of illegal entrants and the consequent apprehension efforts increase in Areas V and VI, the coastal marsh, coastal sage scrub, and southern willow scrub habitats, and thus the wildlife populations supported by the habitats would be adversely affected.

As a result of prior construction activities and ongoing USBP operations, wildlife populations in the area have not been significantly impacted by habitat loss due to the use of best management practices (BMPs), the linear nature of the clearing for road construction, upgrade, and fence and stadium lighting right-of-ways, and more importantly, due to the highly degraded and disturbed nature of the majority of the study area, particularly the areas south of the project corridor. Under this alternative, no new construction and/or additional operational activities are proposed within the project corridor; therefore, no significant impacts to wildlife are anticipated.

4.1.5 Unique and Environmentally Sensitive Areas

4.1.5.1 MSCP

Under the No Action Alternative, no construction would be initiated in Areas I, V, and VI; therefore, no impacts to MSCP lands would occur in these areas. No patrol roads would be closed and re-vegetated under the No Action Alternative; therefore, no beneficial impacts such as re-vegetation of patrol roads on MSCP lands would result from this alternative. MSCP lands would be indirectly impacted by illegal traffic trampling vegetation, brush clearing, trash would be left behind, and fires would continue to be caused by illegal aliens, particularly in Areas V and VI. About 98 acres in Area III were included in the lands designated for conservation under the MSCP, and thus will not be available for future habitat preservation under this program. There are no MSCP lands within the project corridor in Areas II and IV.

4.1.6 Protected Species and Critical Habitats

Under the No Action Alternative, no additional construction would be initiated in Areas I, V, VI; therefore, no direct impacts would occur to any designated critical habitats in these areas. However, some impacts would occur to the San Diego and Riverside fairy shrimp. One linear vernal pool at Arnie's Point near Spring Canyon (in Area III) has been relocated. This pool was known to contain both species of fairy shrimp. A BA was submitted to the USFWS in May 2001, which initiated formal Section 7 consultation. In the BO issued by the USFWS, it was determined that elimination of this vernal pool and restoration (at a ratio of 3:1) of a vernal pool north of the secondary fence would constitute a taking of the species, but would not jeopardize the continued existence of either species.

Several vernal pools were inadvertently restored during the construction of the road and fence platform in Area II. A temporary road was installed (within the footprint of the planned patrol road) to facilitate construction of the fence and road platform. The temporary road blocked the drainage of the several unnamed, minor channels, which caused water to pond north and south of the secondary fence. These ponded areas were subsequently occupied by San Diego and/or Riverside fairy shrimp. INS recently completed formal Section 7 consultation with the USFWS to assess these effects and identify offsetting measures. Additional pools will be restored at the extant vernal pool complex at Arnie's Point to compensate for these losses.

No other direct or indirect adverse effects to threatened or endangered species have occurred as a result of the No Action Alternative. However, critical habitat for Quino checkerspot butterfly was designated on 15 May 2002, a portion of which encompasses parts of Area II. While the ongoing construction activities would occur within critical habitat, no additional suitable habitat containing primary constituent elements for Quino checkerspot butterfly would occur since this area has been previously disturbed by past construction activities. Still, the USFWS and INS agreed that impacts to the lands at the extreme eastern end of Area II would be mitigated since they now occur within the critical habitat and, if left alone, could become suitable habitat. This area contains 2.5 acres of non-native grasslands and 2.4 acres of roads and other bare ground.

Indirect beneficial and adverse effects would occur if the No Action Alternative were selected. Beneficial effects would include protection of species and their habitats that occur immediately north of the secondary fence on various areas of Otay Mesa, particularly at Arnie's Point and east of the Otay Mesa POE. Prior to completion of the Border Infrastructure System, these areas were subjected to daily illegal foot and vehicle traffic, as well as the consequent USBP vehicular traffic.

On the other hand, implementation of the No Action Alternative would indirectly cause additional traffic to occur on either end of the Border Infrastructure System as illegal aliens and smugglers attempt to circumvent the system. The magnitude of these potential effects are difficult to quantify, but are nonetheless real and potentially significant. It is anticipated that more traffic would be diverted to Areas V and VI since these areas provide better and faster access to major thoroughfares and developed areas, thus improving the illegal entrants' chance of success for evading apprehension. Impacts to southwestern willow flycatcher, least Bell's vireo, coastal California gnatcatcher, California least tern, western snowy plover, spreading navarretia, and coastal dunes milk-vetch could occur as a result of illegal foot and vehicle traffic in Areas V and VI. Similar effects could occur in Area I to Quino checkerspot butterfly, San Diego and Riverside fairy shrimp, Otay Mesa mint, Otay tarplant, and San Diego thornmint. However, because there are fewer opportunities for concealment in Area I, less illegal traffic would be expected, and thus fewer impacts to protected species would be incurred.

Critical habitat for the Quino checkerspot butterfly, coastal California gnatcatcher, and both species of fairy shrimp are located north of the project corridor in Area I. Indirect effects to these lands would increase due to illegal foot and vehicle traffic and concomitant USBP enforcement actions.

4.1.7 Cultural Resources

4.1.7.1 Area I (Tin Can Hill)

Area I contains 13 recorded cultural resource properties (see Table 3-4). Three of the sites have disappeared, due to years of testing and salvage. Of the remaining 10, three have been tested and are considered ineligible for inclusion in the NRHP, and seven are currently considered to be of unknown eligibility. Impacts to cultural resources were calculated by assuming that any portion of a cultural resource property within the construction zone would be lost. The results of the investigations are described in Chapter 3 and summarized from the 1999 report of investigations (Buysse and Largent 1999).

Under this alternative, no additional ground-disturbing activities would occur; therefore, no historic properties would be directly affected with the exception of present degradation of sites impacted by natural events and human traffic such as vehicles or foot traffic or intentional looting. The rate of degradation could be increased as illegal traffic increases in an attempt to circumvent the Border Infrastructure System.

4.1.7.2 Area V (Smuggler's Gulch)

Area V contains seven recorded cultural resource properties (see Table 3-7). Three of the sites have disappeared and are thought to have been destroyed. Of the remaining four, two have been tested and are considered ineligible for inclusion in the NRHP, and two have been surveyed and are considered to be ineligible.

Under this alternative, no further action would be taken in Area V. No ground-disturbing activities would occur as a result of the No Action Alternative; therefore, no cultural resources properties would be affected.

4.1.7.3 Area VI (Bunker Hill to Ocean)

Area VI contains five recorded cultural resource properties (see Table 3-7). One of the sites (CA-SDI-15,039) has been tested and is considered to be ineligible for inclusion in the NRHP. Site CA-SDI-15,038 is located on the southern border of the project area. This site has not been evaluated and is considered as having unknown eligibility for inclusion in the NRHP. Site CA-SDI-3627, the Bunker Hill Site, is located on the mesa top locally known as Bunker Hill. The site itself has been minimally investigated. Due to the historical significance of the World War II base-end stations, and the fact that only two other base-end stations are known to exist in San Diego (on Point Loma), it is recommended that the historic component of site CA-SDI-3627 be considered eligible for inclusion in the NRHP and that all base-end stations at the site be avoided, consequently mitigating the potential impacts to the historic component of the site. At some point, a more comprehensive documentation of the historic component at site CA-SDI-3627 should be completed, including both field and archival research. Two sites, CA-SDI-4281 and CA-SDI-222 are currently eligible for listing or are already listed on the NRHP.

No additional ground-disturbing activities in Area VI would occur as a result of the No Action Alternative, therefore no cultural resources properties would be affected other than the present degradation occurring through natural events and/or human episodes of impact. Foot and vehicle traffic from illegal aliens and smugglers attempting to circumvent the Border Infrastructure System in Area IV would exacerbate the current degradation of the sites in Area VI. The magnitude of these effects cannot be determined at the present.

4.1.8 Air Quality

Implementation of the No Action Alternative would cause no significant direct or indirect impacts to air quality. Increased exhaust emissions from patrol vehicles may occur due to increased and more aggressive enforcement efforts. However, increases in vehicle miles traveled may be offset by decreases in individual vehicle exhaust emissions as the USBP continuously updates its vehicle fleet to include newer and "cleaner" model years. Any change in air emissions would be insignificant and air quality would remain virtually the same as described in Chapter 3.

4.1.9 Water Resources

4.1.9.1 Surface Water

Implementation of the No Action Alternative would have no additional direct impacts to surface water bodies that have not been addressed in previous NEPA documents. The only intermittent streams that have been impacted were the lower reaches of Spring Canyon Creek, Deadman's Creek (a tributary to the Spring Canyon Creek) in Area III, and Stewart's Creek (a tributary to the Tijuana River) in Area IV. The latter streams flow northward from Mexico and their intermittent flows are comprised entirely of sewerage discharges. Transboundary pollution from Mexico would continue to affect the water quality of these streams in the United States. Numerous other minor, ephemeral drainages were impacted. All stream crossings were subjected to Section 404/401 permitting process authorized under the Clean Water Act, and mitigation measures were implemented to compensate for these losses at a 1.5:1 to 3:1 ratio. Mitigation plans were coordinated through and approved by the USACE, Los Angeles District; USEPA; USFWS; San Diego Regional Water Quality Control Board (RWQCB); and CDFG (see Section 4.1.9.4 for more information).

Temporary impacts to water quality within the streams occurred during the construction. These effects included increased turbidity and temperature, and potentially lower dissolved oxygen levels. However, due to the severely degraded conditions of the existing water in these streams, these effects are considered insignificant and, thus, in compliance with EO 12114, Environmental Effects Abroad of Major Federal Actions.

Indirect effects to surface waterbodies and water quality within Areas II, III, and IV have been negligible since BMPs were implemented to reduce or eliminate erosion/sedimentation into streams. Indirect effects to streams, ponds, and other water bodies in Areas I, V, and VI could occur as a result of illegal immigrants and smugglers attempting to evade USPB agents. The magnitude of these effects are difficult, if not impossible, to quantify.

4.1.9.2 Flood Peaks

Implementation of the No Action Alternative would have no measurable effect on flood flows in the Tijuana River watershed.

4.1.9.3 Ground Water Resources

Construction of the Border Infrastructure System in Areas II, III, and IV has had no effects on ground water resources in the project region. No additional direct or indirect effects to ground water supplies or quality would be anticipated under the No Action Alternative.

4.1.9.4 Waters of U.S./Wetlands

No additional direct effects would occur to jurisdictional waters or wetlands if the No Action Alternative is selected. As mentioned in Section 4.1.9.1, several stream crossings

have been constructed in Areas II, III, and IV. A total of 1.08 acres of jurisdictional wetlands were impacted in Spring Canyon, Deadman's Creek, and Johnny Wolf Creek (at the eastern end of Area II). A mitigation plan was coordinated through and approved by the appropriate Federal and state agencies that provided compensation of 2.92 acres. The required compensation for the loss of 1.08 acres was 2.54 acres, providing 0.38 acres of remaining credit that could be used for other waters/wetlands impacts within the Tijuana River Watershed. The cost of this mitigation, including land acquisition, has been estimated at $1.2 million.

Construction of a drainage structure in the Canyon del Sol drainage (near the western end of Area IV) caused impacts to about 1,250 ft^2 (0.029 acres) of WUS within a rip-rap lined channel. On-site and in-kind mitigation (i.e., increased rip-rap area) for these losses was provided at a ratio of 1.5:1.

4.1.10 Socioeconomics

Under the No Action Alternative, the ongoing infrastructure construction would be completed in Areas II, III, and IV. The impacts to socioeconomics for Areas II, III, and IV were addressed in three EAs (USACE 1997a and b; INS 1998). The EAs determined that no in migration or out migration within any of these areas would result from the proposed action. No impacts to the population of the area have occurred from the implementation of the Border Infrastructure System within these areas. Short-term indirect beneficial impacts have probably occurred during construction within all three areas as a result from the purchase of construction materials and the temporary influx of workers into the area during the construction effort. A total of 170 acres have been impacted by construction within Areas II, III, and IV. No impacts to housing have occurred. The predominance of construction has taken place in rural areas away from residential and most commercial areas. No impacts to neighborhood cohesion have occurred. Increased development and higher home prices have resulted indirectly in many areas where the primary fence was constructed. This can be seen in Imperial Beach, California, where there has been a 28 percent increase in home prices in 2001 in areas where there has been a reduction in the large groups of illegal immigrants that had previously trespassed through (Times 2001). Although there is no documented direct correlation, the Border Infrastructure System has surely provided some synergistic effects to these land/house values.

Under the No Action Alternative, no new infrastructure would be constructed in Areas I, V, and VI. These areas would remain unprotected, and enforcement efforts would have to be increased. This could entail an increase in patrols and/or enforcement personnel. There is a potential for an increase in the local population of the area as a result of possible influx of new agents and their families. Furthermore, since the areas would remain unprotected, the current level of illegal immigration and drug trafficking through the area would continue, if not increase, as illegal entrants attempt to go around the Border Infrastructure System in Areas II, III, and IV. The associated societal costs for this illegal activity would also increase. These societal costs include, but are not limited to, shoplifting, car theft, and breaking and entering with a concomitant rise in insurance costs. Access to the Border Field State Park located in Area VI would be able to continue. People would still be able to pass messages back and forth through the fence and as a result would be able to remain in contact with friends and family in Mexico. As illegal immigrants attempt to go around the existing infrastructure in Areas II, III, and IV, they would probably traverse Areas I, V, and VI. The terrain within these areas is less rugged and not as expansive as the areas further east of Area I, which consist of large expanses of mountains and desert. Crossing in those areas is extremely dangerous and has resulted in numerous deaths in the last several years. Since

the terrain within Areas I, V, and VI is less rugged and closer to occupied areas, less deaths from illegal crossings within these areas would be anticipated.

4.1.10.1 Executive Order 12898, Environmental Justice

EO 12898 of February 11, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" required each Federal agency to identify and address, as appropriate, disproportionate adverse effects of its proposed actions on minority populations and low-income communities. As indicated earlier in Section 3.10 of this EIS, the racial mix of the study area is predominantly Caucasian. The population becomes increasingly more Hispanic nearer to the border and south of the border. Under the No Action Alternative, all environmental justice issues have been addressed in previous compliance documentation; there would be no impacts in regards to environmental justice.

4.1.10.2 Executive Order 13045, Protection of Children

EO 13045 requires each Federal agency "to identify and assess environmental health risks and safety risks that may disproportionately affect children;" and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. Implementation of the ongoing project activities has not resulted in disproportionately high or adverse environmental health or safety impacts to children. The construction that has occurred away from residential areas resulted in a decrease of traffic throughout the area and created a safer environment for the children on both sides of the border. Furthermore, these actions have resulted in a reduction of illegal immigration, drug trafficking, and other crimes within the area, further creating a safer living environment for these children.

4.1.11 Hazardous Substances

Numerous reported events and locations of violators or hazardous waste generators/storage facilities are near or within the Areas III and IV. The Federal database search identified the location of four facilities or events and the state search found 45 within Area IV alone. None of these, however, impacted the Border Infrastructure System project and no additional hazardous waste issues were created upon construction of the infrastructure system. Although the Border Infrastructure System is nearly complete in Areas II, III, and IV, the entire area and its surroundings had previously been developed. Since implementation of the No Action Alternative does not include any additional ground disturbing activities, it would not result in any adverse impacts due to hazardous substances.

Implementation of this alternative would not have any adverse effects due to hazardous substances in the remaining areas (I, V, and IV). There were no facilities or events identified within the Federal or state databases for these areas, and no additional construction activities would be implemented.

4.1.12 Noise

Construction noise under the No Action Alternative would be negligible, as the Border Infrastructure System is nearly completed in Areas II, III, and IV. Most of these activities are in areas that are surrounded by urban and/or industrial development. Within the United States, there are no noise sensitive receptors within 0.5 miles of the ongoing

construction. Upon completion of the Border Infrastructure System, the ambient noise levels would be expected to return to pre-project conditions. Consequently, any temporary increases to ambient noise levels would be perceived as insignificant.

Implementation of the No Action Alternative would, as mentioned above, increase illegal traffic and the consequent USBP vehicle traffic noise in Areas I, V, and VI. The magnitude of these effects would depend on the level of illegal trafficking that occurs and the location. Increased USBP aerial and vehicular traffic in Area I would have less of an impact than Areas V and VI, since the residential areas and parks are located north of the proposed project corridor in Areas V and VI. The lands north of the Border Infrastructure System in Areas II, III, and IV are comprised of open rangeland and/or industrial and commercial developments.

4.1.13 Aesthetic Resources

Under the No Action Alternative, approximately 170 acres have been or will be impacted by the construction of the Border Infrastructure System in Areas II, III, and IV. Most of the communities (93 percent) within this area consisted of disturbed/developed areas and non-native grasslands. As a result, the areas were considered to have low aesthetic value. Beneficial results would occur to the natural communities north of the infrastructure, resulting from the reduction of illegal foot traffic in that area. Adverse impacts to aesthetic resources from garbage dumping and foot traffic would continue at its present levels and probably increase within Areas I, V, and VI, as illegal traffic continued in this area.

4.2 TACTICALLY OPTIMUM ALTERNATIVE

4.2.1 Geology

The implementation of this alternative would result in permanent alteration of the geologic and topographic features in Areas I, V, and VI. Substantial cut-and-fill activities would occur at Tin Can Hill, Smuggler's Gulch, Goat Canyon, Bunker Hill, Lichty Mesa, and Monument Mesa to produce a fairly level and straight enforcement corridor.

The geology of these areas, on the other hand, could impact the construction process. The cut-and-fill activities in conjunction with the natural potential for landslides to occur would potentially impact the Border Infrastructure System. Landslides are known to be caused from a variety of situations; however, removal of support at the toe of the landslide, increased mass at the head or internally within the landslide, and lubricating the slip surface of the landslide are some of the primary factors in landslide reactivation. On the other hand, Klienfelder (1999b, see Appendix G) reported that an earthen embankment within Smuggler's Gulch could increase the stability of the existing landslides in this area. More detailed engineering geotechnical investigations and analyses would be implemented and incorporated to the final designs and construction plans. These corrective measures would remain in place after the construction is complete to ensure the health and safety of the USBP agents and the integrity of the Border Infrastructure System.

4.2.2 Soils

There is a potential for increased soil erosion during construction due to an increase in surface runoff, however, runoff would be captured by storm drainage, minimizing the potential for soil erosion. Fugitive dust particles are also a typical construction impact but, through the use of water trucks and best management practices, these impacts would be minimized and controlled. In addition, compaction techniques and erosion control measures such as

waterbars, gabions, straw bales, and re-seeding would be implemented to alleviate these situations. The construction activities would also comply with the SWPPP that would be developed for these activities.

Several of the soil associations within the project areas, as noted below, are highly erodible in their natural state and have certain limitations for road construction. These conditions were all taken into consideration during the development of the engineering designs and plans to ensure that the finished cut-and-fill slopes will remain stable. Engineering and construction techniques that would be used to ensure stability of these soils include, but are not limited to, over excavation and backfill, compaction using thinner layers (lifts), revetments, and terraces.

4.2.2.1 Area I

The soils found in Area I are Huerhuero loam (9 to 15 percent slope) and San Miguel-Exchequer rocky silt loam (9 to 70 percent slope). By implementing this alternative, about 71 acres of soils would be directly impacted. The Huerhuero loam (9 to 15 percent slope) soils would account for about 25 acres, and the San Miguel-Exchequer rocky silt loam soil would incur about 46 acres of disturbance. These soils are known to have severe engineering limitations for road location. They also have a rating of fair to poor for road fill and are highly erodible. Within this area there are no known soils that are characterized as prime farmland. Table 4-2 displays the approximate acres that would be impacted under the Tactically Optimum Alternative for each soil type within Area I.

4.2.2.2 Area V

In Area V, Olivenhain cobbly loam (9 to 30 percent slope), Olivenhain cobbly loam (30 to 50 percent slope), Visalia gravelly sandy loam (2 to 5 percent slope), Chino fine sandy loam (0 to 2 percent slope), Huerhuero loam (5 to 9 percent slope), Terrace escarpments, Riverwash, and Carlsbad gravelly loamy sand (2 to 5 percent slope) soils would be directly impacted by the Tactically Optimum Alternative. The total acreage that would be directly disturbed in this area would be about 168 acres. These soils would also undergo short-term impacts due to construction, such as fugitive dust and erosion. However, through the use of BMPs, these impacts would be minimal. The engineering limitations for Terrace escarpments and Huerhuero loam were previously discussed under Area I. Olivenhain cobbly loam is listed as having a poor suitability for topsoil, fair to poor suitability for road fill activities, and a severe limitation for road location. The Carlsbad gravelly loamy sand and the Visalia gravelly sand are recognized as having good suitability for road fill with slight limitations for road location. The Chino fine sandy loam is characterized as having a fair suitability for topsoil and road fill; however, it is listed as having severe road location limitations. Within this area the Visalia and Chino soils are classified as prime farmland, however, they are only considered prime farmland if they are irrigated and drained. Table 4-3 displays the acres to be impacted under the Tactically Optimum Alternative for each soil type within Area V.

4.2.2.3 Area VI

About 70 acres of soils, located in Area VI, would be directly impacted with the implementation of this alternative due to normal construction actions. Within this area, Terrace escarpment soils would have the largest amount of acreage affected with a total of 37 acres being impacted. Individual impacts to the soils inside this area are 0.4 acre of coastal beaches, six acres of Chino silt loam (saline), 17 acres of Chesterton fine sandy loam soils, eight acres of Marina loamy coarse sandy soils, and two acres of tidal flats. The engineering limitations for the Chesterton and Chino soils are considered to be severe for road location and also range from fair to poor for road fill suitability. Terrace escarpments

Table 4-2. Soil Types Impacted by Tactically Optimum Alternative for Area I (Acres)

Soil Type	Acres	Comments
San Miguel-Exchequer rocky silt loam, (9 to 70 percent slope) (Sng)	46	Highly erodible, severe engineering limitations
Huerhuero loam, (9 to 15 percent slope) (HrD)	25	Severe road location limitations

Table 4-3. Soil Types Impacted by Tactically Optimum Alternative for Area V (Acres)

Soil Type	Acres	Comments
Terrace escarpments (TeF)	71	Rocky, faces of terraces, highly erodible
Olivenhain cobbly loam (9 to 30 percent slope) (OhE)	52	Very steep, severe erodibility
Olivenhain cobbly loam (30 to 50 percent slope) (OhF)	1	High erosion hazard, rapid runoff
Huerheuro loam (5 to 9 percent slope) (HrC2)	17	Moderate sheet erosion, poor suitability for road fill
Carlsbad gravelly loamy sand (2 to 5 percent slope) (CbB)	10	Slight erosion hazard, good suitability for road fill
Riverwash (Rm)	12	Occurs in intermittent stream channels
Visalia gravelly sandy loam (2 to 5 percent slope) (VbB)	2	Slow runoff with a slight erosion hazard
Chino fine sandy loam (0 to 2 percent slope) (ChA)	3	Permeability is moderate with slight erosion hazard and slow runoff

soils limitations and suitability are discussed under Area I. The Marina loamy coarse sandy soils are characterized as having good suitability for road fill with slight engineering limitations. The only soil considered to be prime farmland within this area is the Chino silt loam; however, it must be irrigated and drained to receive this classification. Table 4-4 displays the acres that would be impacted under the Tactically Optimum Alternative for each soil within Area VI.

Table 4-4. Soil Types Impacted by Tactically Optimum Alternative for Area VI (Acres)

Soil Type	Acres	Comments
Chino silt loam, saline, (0 to 2 percent slope) (CkA)	6	Prime farmland if irrigated and drained
Coastal beaches (Cr)	0.4	Coastal beach
Terrace escarpments (TeF)	37	Rock, faces of terraces, highly erodible
Chesterton fine sandy loam, (2 to 5 percent slope) (CfB)	17	Poor road fill material and severe road location limitations
Marina loamy coarse sand, (2 to 9 percent slope) (MIC)	8	Found on old beach ridges, slight erosion hazards
Tidal flats (Tf)	2	Found on level areas that are periodically covered by tide waters and are essentially barren

4.2.3 Land Use

Implementation of the Tactically Optimum Alternative would change land use in the project area from existing land uses (i.e., vacant, not graded land; open space reserves, preserves; and extractive industry) to the proposed Border Infrastructure System. Additional fencing under Tactically Optimum Alternative would be in proximity to the existing border fence and the open-nature and rural characteristics of the area north of the fence would not change. Recreational opportunities in the project area would be impacted in the Monument Mesa of the Border Field State Park and the TRVEA horse trails. A large part of the picnic area or Monument Mesa would be removed and the Friendship Circle would be closed to public access. Most of the TRVEA horse trails within 500 ft from the border would be eliminated or significantly altered. The closure and revegetation of USBP patrol roads would improve aesthetic and recreational opportunities in the project area north of the fence and road platform.

Indirect effects to land use would occur under this alternative. As has been experienced in Areas II, III, and IV, commercial and private development have increased in areas north of the secondary fence as these areas become more secure from illegal trafficking. Upon completion of the Tactically Optimum Alternative, induced development would increase, especially in Areas I, II, and III. Because much of the lands in and near Areas V and VI are in public ownership, induced development would be limited in these areas.

4.2.3.1 Area I – Tin Can Hill

Implementation of the Tactically Optimum Alternative would change land use in Area I from vacant, not graded land to the proposed Border Infrastructure System. Construction of fences and associated roads would require approximately 71 acres of vacant lands, which would be permanently converted to the proposed Border Infrastructure System. The rural open-nature and rural characteristics of the areas north of the Border Infrastructure System would probably change due to the increased development that this area is currently experiencing.

4.2.3.2 Area V – Smuggler's Gulch

Implementation of the Tactically Optimum Alternative would change land use in Area V from vacant, not graded land, open space reserves, preserves, and extractive industry to the proposed Border Infrastructure System. Construction activities would require approximately 168 acres to be permanently converted to the proposed Border Infrastructure System. Most of this land is designated as open space reserves and vacant lands. The rural open-nature and rural characteristics of the area north of the Border Infrastructure System would not likely change since most of these lands are in public ownership.

4.2.3.3 Area VI – Bunker Hill

Implementation of the Tactically Optimum Alternative would change land use in Area VI from vacant, not graded land and open space reserves and preserves to the proposed Border Infrastructure System. Construction of fences and associated roads would require approximately 70 acres to be permanently converted to the proposed Border Infrastructure System. All of this, except five acres, is designated as open space reserve. The land use north of the Border Infrastructure System would not be expected to change since this area is within the TRNERR.

A 250-ft-wide corridor of developed parkland at the Monument Mesa of Border Field State Park would be permanently converted and removed from public access. The access road to Monument Mesa would be relocated for visitor access to the remaining portions of

Monument Mesa. The Friendship Circle, the first international boundary monument, would be removed from public access as well.

4.2.4 Fish and Wildlife Resources

4.2.4.1 Vegetation Communities

Implementation of the Tactically Optimum Alternative would permanently alter a total of about 309 acres of wildlife habitat. Most of this habitat (236 acres) would occur within Areas V and VI, where the quality of the habitat is generally considered to be of higher value. Figure 4-1 quantifies the types of habitat that would be affected under this alternative. As can be seen from this figure, most (35 percent) of the area affected would be land classified as disturbed (108 acres). Coastal sage scrub (47 natural and 31 disturbed acres), maritime succulent scrub (27 total acres), native grasslands (20 acres), southern maritime chaparral (19 total acres), ruderal (15 total acres), and coastal salt marsh (12.7 total acres) would be the other major community types that would be impacted by this alternative.

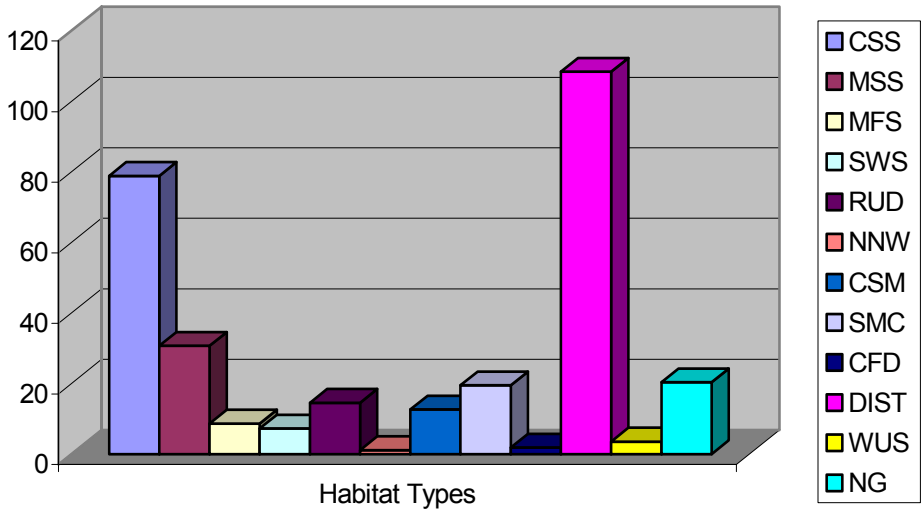


Figure 4-1. Permanent Impacts to Vegetation from Tactically Optimum Alternative

CSS = coastal sage scrub
MSS = maritime succulent scrub
MFS = mulefat scrub
SWS = southern willow scrub
RUD = ruderal
NNW = non-native woodlands
CSM = coastal salt marsh
SMC = southern maritime chaparral
CFD = coastal fore dunes
DIST = disturbed
WUS = Waters of the U.S.
NG = native grassland

It should be emphasized, however, that all suitable slopes would be re-seeded or replanted with native vegetation to help stabilize the slopes and control erosion. The slopes on the north side of the Border Infrastructure System would be allowed to return to or exceed pre-project conditions. For example, the northern slope of the embankment at Smuggler's Gulch could alone provide 37 acres of coastal sage scrub and/or maritime succulent scrub habitat. The slopes between the two fences would be maintained as grasslands to avoid providing concealment opportunities for illegal aliens who breach the primary fence.

The Tactically Optimum Alternative would indirectly benefit some vegetation communities as well. Reduction or elimination of illegal traffic, brush clearing, and fires caused by illegal aliens would benefit the habitats north of the secondary fence. This is particularly true in Areas V and VI where most of the land immediately north of the proposed infrastructure system is publicly owned and not likely to be developed.

4.2.4.2 Wildlife

As mentioned above, about 309 acres would be altered within Areas I, V, and VI under the Tactically Optimum Alternative. About 35 percent (108 acres) of this land, however, is already considered to be disturbed, and thus does not provide suitable habitat for wildlife populations. The wildlife within the project locations would escape to surrounding areas, specifically areas north of Border Infrastructure System in Areas V and VI and to the north and east of Tin Can Hill in Area I. Movement of wildlife would be limited to a northern direction due to the extensive development in the city of Tijuana, south of the border. Area I consists mostly of non-native grasslands so minimal impacts to any wildlife species are expected in the area. Mobile animals would escape to areas of similar habitat, while other slow or sedentary animals such as reptiles, amphibians, and small mammals could potentially be lost during construction. This displacement and/or reduction in the number of animals would not significantly impact animal communities due to the presence of similar habitat adjacent to the project site, which will be preserved as MSCP lands and the relatively low amount of lands being affected. The construction of the infrastructure system would also cause temporary impacts to some habitat due to normal construction activities, but these areas would be re-seeded and restored to native vegetation once the project is complete.

Upon completion of the Border Infrastructure System, limited low-quality habitat would still exist within the corridor between the patrol road and the primary fence, particularly on south facing slopes of cut-and-fill areas. Some birds, small rodents, and reptiles would be expected to inhabit these areas. These animals, particularly the reptiles, would be susceptible to being hit by patrol vehicles.

Wildlife that currently inhabits the surrounding area could be affected by the addition of lighting within the project corridor. The adverse and/or beneficial affects of lighting on reptiles and amphibians is currently unknown, however continual exposure to light has been proven to slightly alter circadian rhythms in mammals and birds. Studies have proven that under constant light, the time an animal is active, compared with the time it is at rest, increases in diurnal animals, but decreases in nocturnal animals (Carpenter and Grossberg 1984). Also, in diurnal animals, the total amount of active time increases with light intensity, while the reverse is true in nocturnal species (Carpenter and Grossberg 1984). The alteration of circadian rhythms by high intensity lighting is minimal, accounting for a maximum of two to three hours of increase or decrease in activity per day (Luce 1977). It has also been shown that within several weeks under constant lighting, mammals and birds would quickly stabilize and reset their circadian rhythms back to their original schedules. The long-term effect of an increased photoperiod on wildlife species is therefore expected to be insignificant.

The greatest impacts to wildlife from the lighting would probably be to nocturnal species. Lights could affect the migratory patterns of birds and insects, causing them to alter their course or schedule. The tendency for nocturnal birds and other wildlife species to congregate around the lights to feed on insects attracted by the lights may increase. This change in behavior may make these species more vulnerable to predation or injury.

The lighting design formulated for the Border Infrastructure System was developed with the consideration of reducing or eliminating backlighting to the north of the secondary fence. Consequently, the illumination from the proposed lighting would be no more than 0.1 ft-candles at the northern toe of the maintenance road. This illumination power is generally equivalent to a clear, moonlit night. Therefore, illumination north of the Border Infrastructure System is not expected to be significantly greater than ambient levels.

Indirect effects would occur to wildlife populations as a result of implementation of the Tactically Optimum Alternative. Increased illegal foot traffic would probably occur in the Otay Mountains east of Area I. Little, if any, vehicle traffic increases would be expected in this area because of the steep and rough terrain. This area contains a BLM Wilderness Area that would be degraded if substantial foot traffic diverted to this area. When the current secondary fence was being planned and constructed, the three stations within the project corridor (Imperial Beach, Chula Vista, and Brown Field) accounted for 52 percent and 55 percent of the total apprehensions in the San Diego Sector during FY 1997 and 1998, respectively. The three stations with jurisdiction in the Otay/Tecate/Jacumba area accounted for 42 percent and 40 percent of the total apprehensions in the same period. Since the construction of the infrastructure system, these percentages have been reversed and actually increased in proportion in the east county areas. In FY 02, the El Cajon, Campo, and Boulevard Stations apprehended over 26,000 illegal entrants, accounting for 65 percent of the total for the San Diego Sector. As the remainder of the infrastructure system is completed, the rate of illegal entry attempts in the east county area and further into Imperial County would continue to increase. The magnitude of the impacts from illegal foot traffic is difficult to quantify and would depend somewhat upon the efficacy of patrol and deterrence efforts along this border region.

Since the Border Infrastructure System would retain most patrol and enforcement activities between the two fences, fewer and less aggressive vehicle trips north of the secondary fence would be required. This reduction in numbers and speeds would indirectly decrease losses to wildlife caused by collisions with vehicles.

4.2.5 Unique or Sensitive Areas

The Tactically Optimum Alternative would involve the conversion of MSCP lands proposed for conservation in the MSCP preserve. The Tactically Optimum Alternative would indirectly benefit unique and sensitive areas by reducing or eliminating illegal traffic, brush clearing, trampling of sensitive resources, and reduce the litter left behind and fires caused by illegal aliens.

4.2.5.1 Area I – Tin Can Hill

There are no MSCP lands proposed for conservation in Area I. However, there are lands proposed (amendment areas) for inclusion to the MSCP. Under the Tactically Optimum alternative, approximately 71 acres would be eliminated from the amendment areas.

4.2.5.2 Area V – Smuggler's Gulch

All of the lands within Area V have been identified by the MSCP for future conservation in the preserve. Therefore, approximately 145 acres of lands would be permanently removed from potential conservation within the MSCP.

4.2.5.3 Area VI – Bunker Hill

Most of the lands within Area VI have been identified by the MSCP for future conservation. Approximately 52 acres of lands would be permanently removed from potential conservation within Area VI.

4.2.6 Protected Species and Critical Habitats

The Tactically Optimum Alternative would directly and indirectly affect Federal and state listed species, primarily in Areas V and VI. Of the species that were discussed previously in Section 3.6 of the EIS, the only Federal species that would be directly impacted are the coastal California gnatcatcher and least Bell's vireo. Intensive surveys were conducted during 1999 and again in 2001 for Federally protected species; the 2001 survey results are included in Appendix G. These were the only Federally listed species discovered during either of the two surveys.

Several state listed species, however, could be affected by the Tactically Optimum Alternative. Species and number of individuals affected in each area are presented in Table 4-5. As can be seen from this table, Area I would have the fewest direct impacts on the number of individuals. Construction in Area V would directly impact the greatest number of individuals. San Diego sunflower and barrel cactus would be the species most affected.

Indirect effects would occur to species and habitat as a result of implementation of the Tactically Optimum Alternative. Land development would increase in Area I with the construction of the infrastructure system, as has been seen in Areas II, III, and IV.

Table 4-5. Number of Individuals Federal and State-listed Species Affected in Each Area for the Tactically Optimum Alternative

Species Affected	Area I	Area V	Area VI	Total
	Number	Number	Number	Number
Baja California birdbush		46		46
Barrel cactus		722	66	788
Burrowing owl	2			2
Coastal California gnatcatcher			3	3
Cliff spurge		507		507
Coastal agave			338	338
Goldenspined cereus			4	4
Least Bell's Vireo		2		2
Orcutt's bird's beak		205		205
Orcutt's dudleya			566	566
San Diego sunflower	8	2,556	50	2,614
Snake cholla		4	254	258
South coast saltscale			67	67
White lilac		66		66

Source: AMEC 1999

Under this alternative about 71 acres of coastal California gnatcatcher and Quino checkerspot butterfly critical habitat would be impacted in Area I. Although neither species has been recorded within the project footprint and little, if any, or the species' primary constituent elements occur within the project footprint, the INS/USBP would still be required to offset the potential effects to the critical habitat, through formal Section 7 consultation. In addition, about 0.3 acres of western snowy plover critical habitat would also be impacted under this alternative. These effects would also have to be offset and would require formal consultation under the Section 7 process.

4.2.7 Cultural Resources

4.2.7.1 Area I (Tin Can Hill)

Area I contains 13 recorded cultural resource properties (see Table 3-4). Three of the sites have disappeared due to years of testing and salvage. Of the remaining 10, three have been tested and are considered ineligible for inclusion in the NRHP, and seven are currently considered to be of unknown eligibility. Impacts to cultural resources were calculated by assuming that any portion of a cultural resource property within the construction zone would be lost. The results of the investigations are presented in the 1999 report of investigations (Buysse and Largent 1999).

The Tactically Optimum Alternative would involve completion of the Border Infrastructure System that optimizes tactical considerations, including line-of-sight, in such a manner that USBP agents consistently occupy a strategically superior position. These considerations dictate a project alignment that is fairly level and is maintained within a virtually straight and parallel corridor. This alternative would require substantial cut-and-fill activities to minimize slopes of road surfaces at hills and canyons.

These cut-and-fill activities in this area would directly or indirectly impact the remaining sites with unknown eligibility. Those seven sites would require testing to determine their eligibility status and possibly mitigation should they meet the eligibility criteria for the NRHP.

4.2.7.2 Area V (Smuggler's Gulch)

Area V contains seven recorded cultural resource properties (see Table 3-5). Three of the sites have disappeared and are thought to have been destroyed. Of the remaining four, two have been tested and are considered ineligible for inclusion in the NRHP, and two have been surveyed and are considered to be ineligible. Under this alternative, no historic properties would be affected.

4.2.7.3 Area VI (Bunker Hill to Ocean)

Area VI contains five recorded cultural resource properties, (see Table 3-6). One of the sites (CA-SDI-15,039) has been tested and is considered to be ineligible for inclusion in the NRHP. Site CA-SDI-15,038 is located on the southern border of the project area. This site has not been evaluated and is considered as having unknown eligibility for inclusion in the NRHP. Site CA-SDI-3627, the Bunker Hill Site, has both prehistoric and historic components and is considered to be potentially eligible for the NRHP, but would require research and testing to determine that status. Two sites, CA-SDI-4281 and CA-SDI-222 are currently eligible for listing or are already listed on the NRHP.

Under this alternative, four of the five known sites would be adversely affected. These sites would require additional work either to determine their eligibility status and/or mitigate project impacts through avoidance, monitoring, capping, and excavation.

4.2.8 Air Quality

4.2.8.1 Construction Emissions

Air quality impacts would primarily be from temporary construction activities and mobile sources associated with the construction phase of the project. Emissions would result from construction equipment and vehicular exhaust as well as fugitive dust from construction activities and travel on unpaved roadways. Additional emissions would occur from vehicle exhaust from the delivery of materials and the travel of workers to and from the site. Details of the emission estimation methods for this alternative were included in Appendix D of the Draft EIS.

Implementation of the Tactically Optimum Alternative would result in larger impacts than the other action alternatives. This alternative involves completion of sections that optimizes tactical considerations, including line-of-sight, in such a manner that USBP agents consistently occupy a strategically superior position. These considerations dictate a project alignment that is fairly level and is maintained within a virtually straight and parallel corridor.

Impacts from this alternative are quantified by extrapolating design-specific emission estimates for the Proposed Action Alternative for the alignment most geometrically similar based on the construction impact area. Due to topography-related earthwork required for achieving the tactically optimum configuration, this alternative could result in significant impacts to the region's air quality. The estimated air quality impacts are summarized in Table 4-6 and are briefly described in the following subsections for each of the three areas.

Table 4-6. Estimated Emissions for Tactically Optimum Alternative (tons)

	CO	ROC	NOx	SOx	PM_{10}
Area I – Tin Can Hill	8.1	1.0	16.8	1.5	186.3
Area V – Smuggler's Gulch	74.7	12.2	293.1	24.0	1320.8
Area VI – Bunker Hill to Pacific Ocean	2.8	0.3	4.8	0.4	220.4

CO = Carbon Monoxide
ROC = Reactive organic compounds
NOx = Nitrogen oxides
SOx = Sulfur oxides
PM_{10} = Particulate matter

4.2.8.1.1 Area I – Tin Can Hill

The Tactically Optimum Alignment for the Area I would require substantial cut-and-fill activities to minimize slopes of road surfaces at hills and canyons. Cuts would be made primarily at Tin Can Hill to achieve this alternative. Blasting with small charges would be used for the cut portions along this alignment. This blasting would result in emissions of combustion products from the explosives denotation and particulate from the shattering of earth and rock. However, these emissions would be secondary to other construction related emissions including the exhaust from heavy duty diesel construction equipment and fugitive dust emissions from earthmoving operations.

4.2.8.1.2 Area V – Smuggler's Gulch

The Tactically Optimum Alternative for Area VI would require a project alignment that is fairly level and is maintained within a virtually straight and parallel corridor. Tactical considerations that USBP agents consistently occupy a strategically superior position pairs this alternative with alignment SG-5 of the proposed action alternative, which ensures that patrol agents do not give up a substantial amount of high ground. Similarly, this alternative involves extensive fill activities in Smuggler's Gulch. This results in a potentially significant impact, with annual emissions exceeding the nitrogen oxides (NOx) *de minimus* emission

thresholds for Federal conformity. Since this alternative was not selected as the preferred alignment, a conformity analysis to ensure compliance with the California SIP would not be required.

4.2.8.1.3 Area VI – Bunker Hill to Pacific Ocean

The Tactically Optimum Alignments for Area VI, Bunker Hill to Pacific Ocean, is similar in configuration to the BHPO-1 alignment for the Proposed Action Alternative.

This alignment would place the project's infrastructure directly through the Monument Mesa at Border Field State Park. This alignment would be kept as straight and parallel to the U.S./Mexico border as possible, which represents the ideal case from a functionality standpoint. Therefore, the impact of the Tactically Optimum Alternative for this case is extrapolated from BHPO-1.

While construction emissions would be temporary in nature, the construction period would extend over at least three years. It is assumed for analysis purposes that construction would occur in one area at a time. Construction activities for Area I and VI would each occur over approximately a one-year time frame and would not exceed the Federal conformity *de minimus* thresholds (50 tons per year [tpy] for ozone precursors, volatile organic compounds [VOC] and NOx, and 100 tpy threshold for CO). Annual emissions of NOx resulting from construction of the alignment in Area V would exceed the *de minimus* threshold of 50 tpy, even if the operations were staged over multiple years.

While this project may be considered significant due to the exceedance of the *de minimus* thresholds, this does not preclude the implementation of this alternative. Federal actions, which do not demonstrate emission levels below the *de minimus* thresholds, may be carried out, provided they demonstrate conformity with the SIP. This would require preparation of a comprehensive air quality conformity analysis prior to construction.

4.2.8.2 Operation

There would be no increase in the number of USBP agents or vehicles as the result of the implementation of the Tactically Optimum Alternative. Air quality impacts may actually decrease somewhat due to more effective vehicular patrol of the border area and roadway improvements that would minimize fugitive dust emissions. Therefore, there are no long-term significant adverse impacts that would result from the operation of the improved infrastructure system.

4.2.9 Water Resources

4.2.9.1 Surface Water

Direct effects to surface waterbodies, primarily ephemeral streams, would occur under the Tactically Optimum Alternative. Water quality of ephemeral streams could be degraded during the construction activities by erosion/sedimentation and/or accidental spills of petroleum, oils, and lubricants (POL) used in the construction equipment. However, ephemeral streams typically have lower water quality because the flow is generated by stormwater runoff. Furthermore, all of the major drainages within the project corridor flow northward from Mexico, where stormwater and sewage discharges are often mixed. Transboundary pollution from Mexico would continue to affect streams in the United States. Because the flows of major drainages in the project corridor are northward from Mexico, there is little if any possibility of transboundary pollution from the United States entering Mexico. Thus, negligible adverse impacts would occur to the water quality of these streams and the action would be considered to be in compliance with EO 12114, Environmental Effects Abroad of Major Federal Actions. BMPs would be implemented to reduce erosion/sedimentation effects and any accidental spills would be cleaned up immediately.

Indirect effects to surface water supplies and/or quality would be insignificant, primarily due to the lack of surface water resources in the project corridor. Sedimentation into the area's streambeds and the Tijuana River estuary could affect water quality, if revegetation efforts on the newly constructed slopes are not successful. However, the INS/USBP would have a vested interest to ensure that revegetation efforts are successful. In addition to compliance with regulatory obligations, vegetation and other erosion control measures would be implemented to ensure that the slope would not erode or fail during or after completion of construction activities.

The use of PennzSuppress®, or an equivalent product, would not affect surface water quality. Although this is a petroleum-based resin, it would be expected to bind with the aggregates used as road material. Any leaching that may occur would be non-toxic to fish and other aquatic organisms (see Appendix G).

4.2.9.2 Flood Peaks

Implementation of the Tactically Optimum Alternative would temporarily affect flood flows by increasing the rates of stormwater runoff. These effects would be expected to be insignificant and would only last until the cut-and-fill slopes become stabilized with vegetation. Some of the granitic slopes, such as those that would occur at Tin Can Hill, would not be possible to revegetate. Therefore, surface water runoff on these slopes would be increased. Drainage structures would be designed to sufficiently convey stormwater flows, regardless of whether the drainage flowed into or from Mexico.

EO 11988 requires Federal agencies to avoid, if possible, any development within the 100-year floodplain of streams. Where avoidance is not possible, EO 11988 requires the impacts to be minimized or mitigated. Since IIRIRA requires a barrier system to be constructed parallel to the international border, avoidance of streams that flow perpendicular to the border is not possible. Implementation of the Tactically Optimum Alternative would require impacts to the 100-year floodplain within the lower Tijuana River valley.

4.2.9.3 Groundwater Resources

No direct or indirect impacts to groundwater resources would be anticipated as a result of implementation of the Tactically Optimum Alternative. The only potential for groundwater effects would be accidental spills of POL. However, all spills, if they occur, would be cleaned up immediately. Any spills in excess of five gallons would be immediately reported to the San Diego County Department of Environmental Health.

4.2.9.4 Waters of U.S./Wetlands

The Tactically Optimum Alternative would impact several ephemeral streams in Areas I, V, and VI and coastal wetlands in Area VI. Table 4-7 presents the impacts to jurisdictional Waters of the U.S., including wetlands by area and habitat type. Temporary and indirect effects to Waters of the U.S., including wetlands, would occur during the construction period from erosion and siltation. Erosion/sedimentation controls would be emplaced, as required by the SWPPP, which would substantially reduce or eliminate potential indirect adverse effects. As can be seen from Table 4-7, the majority of wetland impacts under this alternative would occur in Area VI, and primarily (31 percent [6.9 acres]) within the coastal salt marsh habitat type. Compensation for these losses would be typically provided at a 2:1 to 3:1 ratio.

Beneficial, long-term, indirect effects would result from construction of the infrastructure system. Illegal foot and vehicle traffic would be eliminated in areas north of the tertiary fence. Based on review of aerial photography and ground reconnaissance, there are literally hundreds of trails that have been established by illegal aliens through the marshes within the Tijuana River estuary (see Photograph 1-3, Chapter 1). Assuming a

Table 4-7.
Permanent Impact (Acres) Expected under the Tactically Optimum Alternative

Waters/Wetland Type	Area I	Area V	Area VI	Total
Unvegetated Waters of U.S. (WUS)	0.5	3.0	0.1	3.6
Southern willow scrub	0	2.7	2.6	5.3
Tamarisk scrub	0	0	0.3	0.3
Coastal salt marsh	0	0	6.9	6.9
Disturbed coastal salt marsh	0	0	8.1	8.1
Mulefat scrub	0	0.8	3.4	4.2
Disturbed Wetlands	0	0	0.7	0.7
Total	0.5	6.5	22.1	29.1

conservative estimate that each of these trails are two ft wide (many are up to four ft wide) and transect the entire estuary (approximately 2.25 miles), 50 such trails would impact about 27 acres. Absent of the illegal foot traffic, these trails would be allowed to revegetate and regain the functional value as a coastal marsh. Conversely, without the Border Infrastructure System, these impacts would continue and likely increase.

Relative to EO 11990, impacts to wetlands would be unavoidable under this alternative. Any wetland losses would require compensation/mitigation to ensure a no-net loss of wetlands. However, since alternative designs and alignments, as presented for the Proposed Action, are available that would reduce wetland impacts and achieve the stated purpose and need, the Tactically Optimum Alternative would not be in full compliance with EO 11990.

4.2.10 Socioeconomics

4.2.10.1 Area I

No impacts to population are expected from the implementation of the Tactically Optimum Alternative within Area I. There would be a short-term influx of military personnel during the construction phase but all personnel are expected to leave once construction is complete. As a result, there would be no changes to the population or racial mix of the area. Military personnel are expected to perform the majority of the construction, so no increase in employment would be anticipated. Short-term increases in income for local businesses are expected resulting from construction personnel purchasing items from the local area, temporary housing of construction personnel, and purchasing of construction materials. No residential or commercial structures are anticipated to be impacted from the implementation of this alternative. Furthermore, since there is no anticipated population increase, the demand for housing within Area I would not increase as a result of the implementation of the Tactically Optimum Alternative. Since construction would not occur within or near residential areas, no impacts to community cohesion are expected.

The Tactically Optimum Alternative construction would enable the USBP to more effectively patrol the area and would subsequently deter illegal immigration and drug trafficking within the area. This would, in turn, reduce crime and the other societal costs that are associated with such activities. As illegal immigrants attempt to go around the infrastructure constructed in Areas I through VI, they would be forced into areas west of Area I. The terrain within these areas consists of large expanses of mountains and desert. Crossing in those areas is extremely dangerous and has resulted in numerous deaths in the last several years. Consequently, the proposed infrastructure could indirectly result in increased deaths of immigrants who attempt to illegally enter through those areas.

4.2.10.2 Area V

The impacts to Area V, under the Tactically Optimum Alternative, would be similar to those under Area I. Within Area V, approximately 168 acres would be utilized for construction of the secondary fence and associated roads. Otherwise, the impacts for Area V would be the same as those discussed in Section 4.2.10.1 for Area I.

4.2.10.3 Area VI

Similar impacts would occur within Area VI as those that occur within Area I under the Tactically Optimum Alternative. Within Area VI, a total of 70 acres of fence and road construction is anticipated. Access to the Border Field State Park would be restricted, as an approximately 250-ft wide corridor through the park would be removed from public access. Also as a result, access to Friendship Circle would be completely eliminated. Since there would be no access to Friendship Circle, then visitors on either side of the border would no longer be able to pass messages back and forth and visit with friends and family members who may be located on the other side of the border. This would create a negative impact on the social structures of those people as contact between them is further restricted.

4.2.10.4 Executive Order 12898, Environmental Justice

As indicated earlier in Section 3.10 of this EIS, the racial mix of the study area is predominantly Caucasian. This racial mix becomes predominantly more Hispanic closer to the border and becomes essentially all Hispanic south of the border. No impacts to housing are anticipated from the implementation of the Tactically Optimum Alternative. As a result, there would be no displacement of minority or low-income families, and therefore no impacts in regards to environmental justice.

4.2.10.5 Executive Order 13045, Protection of Children

EO 13045 requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children;” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. Implementation of any of these alternatives would not result in disproportionately high or adverse environmental health or safety impacts to children on either sides of the border. The construction would take place away from residential areas and would result in a decrease of traffic throughout the area, creating a safer environment for all children. Furthermore, these alternatives would result in a reduction of illegal immigration, drug trafficking, and other crimes within the area further creating a safer living environment for the children on both sides of the border.

4.2.11 Hazardous Substances

No hazardous substances are known to occur in Areas I, V, and VI, according to Federal and state databases. Therefore, no effects from hazardous substances are expected upon implementation of this alternative. However, if unknown hazardous substances were identified during construction of the proposed project, the appropriate authorities would be immediately notified. During the construction phase of this project, secondary containment would be placed around any regulated fluid storage vessels kept onsite. In the event of a spill or leak the appropriate authorities would be notified and recommended clean-up procedures would be followed to remediate the spill/leak.

4.2.12 Noise

Construction activities would increase ambient noise levels during daylight hours as a result of implementation of this alternative. The magnitude of these increases would be greater in Areas V and VI, where there are residential areas and parks. Noise attenuation is usually estimated at 6 dBA each time the distance is doubled (i.e., a 100 dBA noise source at 100 ft would be reduced to 94 dBA at 200 ft). Other variables, including atmospheric conditions, factor into the equation as the distance from the noise source increases. For example, a noise that occurs in hilly terrain on a windy day would not travel as far as one that is generated on a calm day on level ground. Construction noise from heavy equipment is expected to be in the 80 to 100 db level at the construction site. As indicated in Section 3.12, this is equivalent to garbage disposals, lawn mower and chain saws. Because of the terrain and vegetation in these areas and the distance to the residential areas, noise levels would be expected to be attenuated to insignificant levels.

Visitors and recreational users of the Border Field State Park would experience increased noise levels during the construction. Construction noise at the day use area on top of Monument Mesa would be at levels that would annoy visitors; however, no harmful levels of noise would be generated. Furthermore, recreational users and visitors would be kept away from construction zones for safety reasons, and thus would assure that harmful effects of noise would not be incurred. Within the remaining areas of the park, such as the horse and hiking trails, noise levels would be attenuated by distance, terrain, vegetation, and the atmospheric conditions, particularly the wind from the Pacific Ocean. Slight increases might be temporarily perceptible, but would not be expected to be at levels that would be considered annoying. Mitigation of these effects could include a restriction of construction activities to only non-holiday weekdays.

Construction noise has been reported to potentially disturb some species of birds, particularly some of the protected species such as least Bell's vireo (SANDAG 1999; NOAA 2001). The effect of noise is the masking of mating and/or territorial calls, which could reduce the probability of success of nesting and future propagation of the species. Others such as Awbrey and Hunsaker (1995) reported that noise appeared to be less important to the breeding success than the presence of suitable habitat. They reported that "the most successful California Gnatcatcher breeding site we have found in San Diego County is under the incoming flight path for Lindbergh Field." This site had sound pressure levels that routinely exceeded 70 dB and yet the coastal California gnatcatcher as well as other species of birds seemed to flourish.

Short-term effects would be expected to wildlife near the proposed blasting sites at Tin Can Hill (Area I). The noise created by this would last less than 10 seconds and would be expected to be in the low to moderate range. All blasting would be done during daylight hours. Detonation would most likely frighten mammals and birds around the sites and cause them to flee the area until normal conditions in the area resumed. Vibrations from the activities could have some short-term impacts to reptiles, mammals, and birds in the area.

Proposed blasting activities could interfere with courtship of some bird species and disturb nest building and egg laying. More importantly, blasting vibrations could also cause eggs to crack. This would have a significant effect to individuals if egg damage were to occur too late in the nesting season for the birds to renest. Therefore, blasting activities would not occur between 15 February and 30 August to avoid disturbances to bird mating activities and nesting season, to the extent practical. As will be discussed later in Section 5, INS/USBP would conduct pre-construction surveys for migratory birds and, in particular, protected bird species, to ensure that no nesting or fledging species would be impacted. Vegetation clearing would be conducted during non-nesting seasons to the extent practicable to avoid. Temporary sound barriers such as earthen berms and sound curtains would be erected in

areas close to habitats that are known to be occupied by protected species to ensure that construction noise falls within ambient levels during breeding and nesting seasons.

The decibel levels expected to occur with each blast would fall within the "uncomfortably loud" category (120 dB), but would last for less than 10 seconds. The vibration levels and air blast overpressure at any nearby structures would need to be calculated to ensure that the peak particle velocity does not exceed 2 inches per second at the residential areas south of the border. The existing primary fence would serve as barrier to noise levels on the Mexican side of the border. Other mitigation measures that would be implemented to reduce noise levels and vibrations are discussed further in Section 5 of the Final EIS.

4.2.13 Aesthetic Resources

Under the Tactically Optimum Alternative, approximately 201 acres of wildlife habitat (309 total acres; 108 disturbed) would be permanently altered, affecting both the vegetation communities and the wildlife they support. As described in Section 4.2.4, the majority of native habitat would occur within Areas V and VI where the habitat is considered to be of higher value both biologically and aesthetically. Slopes in the impact area would be re-seeded, where appropriate, with native vegetation, which would help alleviate direct impacts to the local viewshed. In addition to direct loss of native vegetation communities, the viewshed of the area would be adversely impacted from the footprint of the fences themselves. This alternative would have some indirect benefits to vegetation aesthetics north of the project area, resulting from the reduction of illegal traffic, brush clearing, fires, and littering caused by illegal aliens.

4.3 PROPOSED ACTION

4.3.1 Geology

The Proposed Action Alternative would result in similar impacts to geology as those previously discussed in Section 4.2.1 under the Tactically Optimum Alternative. However, the magnitude of the effects on geologic features under the Proposed Action Alternative would be less than that expected for the Tactically Optimum Alternative, and would vary greatly among the different alignments. In Area I, Alignments TCH-1 (preferred alignment) and TCH-2 would have the greatest impact to geology, since these two alignments require substantial cut-and-fill activities at Tin Can Hill. Alignment TCH-3 would be routed northward, around Tin Can Hill, and thus would have insignificant permanent effects to the area's geologic features. Alignment TCH-4 would result in less effects than TCH-3 but more than TCH-1 or TCH-2.

The alignments in Area V would be similar and would vary among each other primarily by the amount of cut-and-fill required. All of these alignments, however, would be less than that expected for the Tactically Optimum Alternative.

The preferred alignment (SG-1) would create an earthen embankment about 135 ft high and 80 ft wide at the top. This structure would substantially change the topography within the project corridor. A similar embankment, with steeper slopes (1:1.3) was constructed in Smuggler's Gulch for Mexico's Encinada Highway, which is less than 0.25 mile south of the proposed embankment.

As discussed previously in Section 3.1, there are slip planes located in Smuggler's Gulch that would have to be taken into consideration during the preparation of the final engineering plans. However, Klienfelder (1999b), a local geo-technical engineering firm, reported that the proposed embankment in Smuggler's Gulch " . . . should increase the stability of this landslide. . ." The report further stated " . . . that the risk of slope failure as a

result of the presence of the slip surface is low." No significant amount of groundwater seepage was anticipated on cut slope faces. In addition, the surficial instability of exposed soils in the cut-and-fill slopes was considered to be adequate, provided revegetation and surface drainage systems, as proposed, would be implemented (Klienfelder 1999b; see Appendix G).

Substantial changes to local topography would also occur in Area VI under either the BHPO-1 or BHPO-4 (preferred) alignment. Both of these alignments require construction of an earthen embankment on the west and east sides of Lichty Mesa. Alignment BHPO-2 and BHPO-3 would generally follow existing roads and natural contours and thus would have insignificant effects on the area's geologic features.

As mentioned in Section 4.2.1, all cut-and-fill actions would have to be designed and planned in consideration of the highly erodible soils and the high potential for landslides in Southern California.

4.3.2 Soils

The Proposed Action Alternative would directly and indirectly impact soils, and in various amounts. Permanent impacts would result in the soils being lost to potential agricultural or biological production due to the construction of the Border Infrastructure System. The Proposed Action Alternative would permanently alter about 37 acres in Area I and 33 acres in Area VI. The preferred alignment in Area V would permanently impact 93 acres. The only potential effects with any known soils classified as prime farmland is in Area VI; these are discussed later in this section. There is also a potential for increased soil erosion during construction due to an increase in surface runoff; however, runoff would be captured by storm drainage, thus minimizing the potential for soil erosion. In addition, compaction techniques and erosion control measures such as jute fiber, stilling basins, waterbars, gravel bags, gabions, straw bales, and re-seeding would be implemented to alleviate these situations, as described in Section 2. A SWPPP would be required since the area of impact would be greater than one acre.

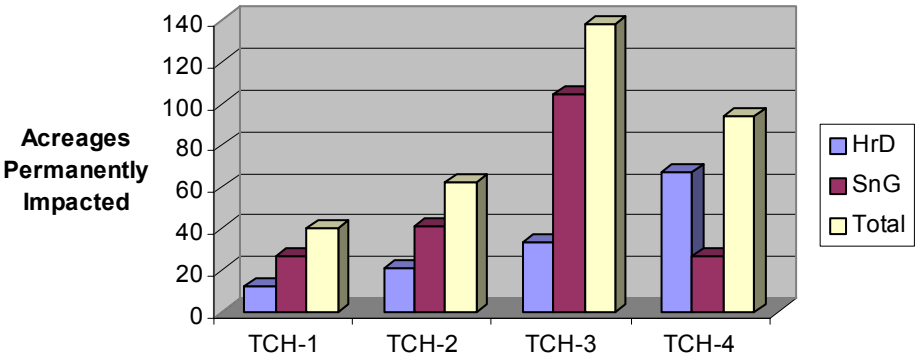
As mentioned previously in Section 4.2.2, several soil associations are present that require special engineering designs and construction methods to allow the soils to be used for road material. Construction methods that would be implemented to ensure slope stability and erosion control would include, but are not limited to, over excavation and backfill, compaction using thinner layers (lifts), revetments, and terraces.

4.3.2.1 Area I Soils

The alignment that would result in the least amount of soils being affected in Area I is the preferred alignment (TCH-1), which would permanently impact about 37 acres. The other alignments would require more soils (62 to 138 acres) to be permanently disturbed.

The soils impacted within Area I and its various alignments are depicted in Figure 4-3. The San Miguel-Exchequer rocky silt loam soil association would receive the greatest amount of disturbance in Area I. The largest potential amount of this soil being permanently disturbed is in alignment TCH-3 and TCH-4 (104 acres and 67 acres, respectively). The soils in this area are known to have severe engineering limitations regarding road location, with fair to poor suitability for road fill, and are all highly erodible. Construction of the TCH-1 alignment would result in temporary impacts to about three acres. These areas would be revegetated immediately upon cessation of the construction activities to reduce the potential for erosion.

Figure 4-3. Soil Impacts Within Area I



Soil Names
HrD = Huerhuero loam, 9 to 15 percent slope
SnG = San Miguel-Exchequer rocky silt loam, 9 to 70 percent slope

4.3.2.2 Area V Soils

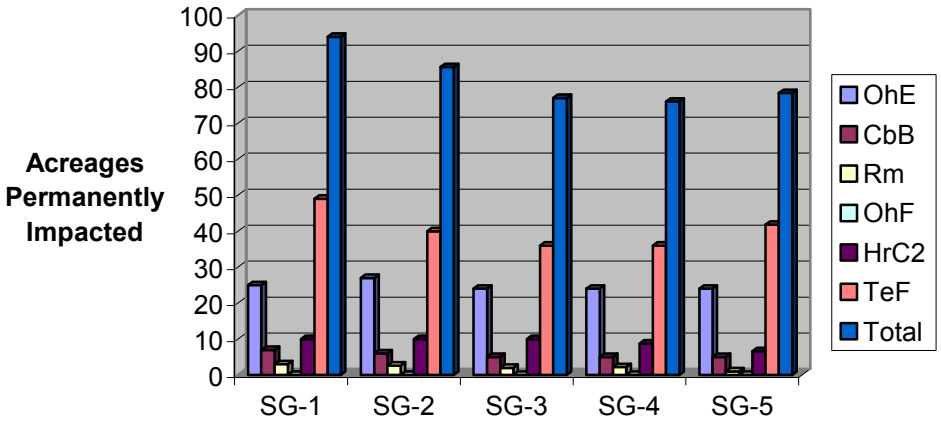
Area V consist of soils ranging from Terrace escarpments, which are steep rocky soils generally found on even fronts of terraces, to the Carlsbad gravelly loamy sand soils found on ridges and swales with slopes of 2 to 30 percent. According to the USDA (1973), all the soils located within Area V are considered to have high erosion rates, fair to poor suitability for road fill activities, and have severe engineering limitations for road location (except for the Carlsbad soil). These limitations have been considered during the design phase of the proposed cut and fill activities. Carlsbad soil is recognized as having good suitability for road fill with slight limitations for road location and a slight erosion hazard. Regardless of which alignment is chosen, the greatest impacts would occur on Terrace escarpment soils (about 45 acres for the preferred alignment) as can be seen in Figure 4-4. The Terrace escarpment soils comprise approximately 49 percent of the soils within Area V that would be impacted within the preferred alignment (SG-1). The remaining soils that would be impacted within Area V and their associated acreages are as follows: Carlsbad gravelly loam sand (8.5 acres), Huerhuero loam (10 acres), Olivenhain cobbly loam, 9 to 30 percent slopes (25 acres), Olivenhain cobbly loam, 30 to 50 percent slope (0.02 acres), and Riverwash (4 acres).

Some temporary impacts to soils will occur during the construction activities, especially within cut-and-fill areas. Approximately 5.4 acres, primarily within the Terrace escarpment soils, would be impacted. These areas would be re-seeded with native vegetation immediately upon completion of the construction activities.

4.3.2.3 Area VI Soils

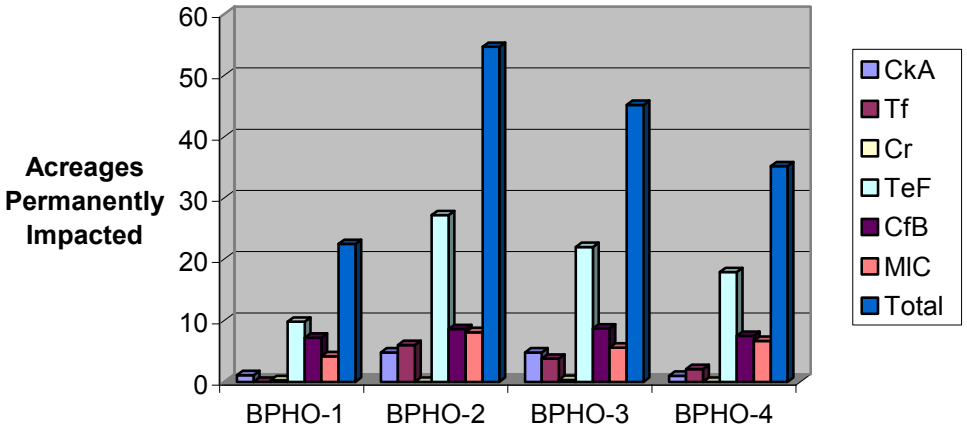
Permanent impacts to soils in Area VI would range from 23 acres to 55, depending upon the alignment selected. Alignment BHPO-2 would cause the largest amount of impacts (55 acres), followed by BHPO-3 (45 acres). The alignment that would result in the least amount of soils (23 acres) being permanently disturbed is BHPO-1, which was the “preferred alignment” identified in the Draft EIS. However, INS has since elected to use the BHPO-4 alignment, based on comments received during the public comment period. This alignment would affect about 33 acres, consisting primarily of Terrace escarpment soils (Figure 4-5).

Figure 4-4. Soil Impacts Within Area V



Soil Names:
OhE = Olivenhain cobbly loam, 9 to 30 percent slopes
CbB = Carlsbad gravelly loam sand, 2 to 5 percent slopes
Rm = Riverwash
OhF = Olivenhain cobbly loam, 30 to 50 percent slopes
HrC2 = Huerhuero loam, 5 to 9 percent slopes, eroded
TeF = Terrace escarpments

Figure 4-5. Soil Impacts Within Area VI



Soil Names
CkA = Chino silt loam, saline, 0 to 2 percent slope
Tf = Tidal flats
Cr = Coastal beaches
TeF = terrace escarpments
CfB = Chesterton fine sandy loam, 2 to 5 percent slope
MlC = Marina loamy coarse sand, 2 to 9 percent slope

Under the BHPO-4 alignment, Terrace escarpment soils account for over 30 percent of the soils. Chino silt loam (saline) soils are classified as prime farmland, however, it is only classified as prime farmland soils if it has been irrigated and drained. The largest amount of this soil, which would be permanently affected, is five acres; these losses would occur under the BHPO-2 or BHPO-3 alignments. The preferred alignment (BHPO-4) would affect only about an acre of Chino silt loam soils.

Approximately 2.5 acres would be temporarily impacted during the construction of the embankments on and off Lichty Mesa. Most (1.5 acres) of these impacts would occur within the Terrace escarpment soils. All of these areas would be revegetated upon completion of the construction activities to reduce any erosion potentials.

4.3.3 Land Use

Implementation of the Proposed Action would change land use in the project area from existing land uses (i.e., vacant, not graded land; open space reserves, preserves; and extractive industry) to the proposed Border Infrastructure System. Additional fencing under the Proposed Action would be in proximity to the existing border fence, and the open-nature and rural characteristics of the area north of the fence would not change.

Recreational opportunities in the project area would be impacted at Border Field State Park under the BHPO-1 and BHPO-3 alignments. A corridor about 150 ft wide along the border would be removed from public use for these two alignments. Access to the Friendship Circle would also be restricted. However, under the preferred alignment (BHPO-4), access to the day use area at Monument Mesa would be unlimited during normal park hours. An aesthetically pleasing fence and gate would be constructed (see Appendix J for conceptual designs) to allow access to the park, while maintaining the objective of the enforcement zone. Thus, no long-term significant impacts to recreational opportunities at this facility would occur.

Under the preferred alignment, some horseback trails would be closed during construction within the Area V. The switchback roads in Smuggler's Gulch (approximately 0.6 miles) and the roads on the western slope of Bunker Hill (about 0.4 miles) would be permanently affected. However, it is anticipated that the access road up the Smuggler's Gulch embankment could be used to access Spooner's Mesa or the mesa east of Smuggler's Gulch. The closure and revegetation of USBP patrol roads would improve aesthetic and recreational opportunities in the project area. Affected acreages in each area and for each of the alternate alignments are discussed in the following paragraphs. Indirect effects to land use would be the same as that described for the Tactically Optimum Alternative.

4.3.3.1 Area I - Tin Can Hill

According to SANDAG, land use within Area I is designated as undeveloped. The existing land use is consistent with this classification. Lands within Area I are currently undeveloped land used for daily USBP operations and weekend off-road vehicle opportunities. Implementation of the proposed action would not significantly change or conflict with the existing land use classification.

Affected acreages in Area I for each of the alternate alignments are shown in Table 4-8. As can be seen from this table, the preferred alignment (TCH-1) would have the least permanent impacts to land use. Under this alternative, about 37 acres, which is nearly half of the second lowest alternate alignment (TCH-2) would be permanently affected. The other two alignments would result in significantly more land being permanently removed from future uses.

Table 4-8. Acres Impacted in Area I under the Proposed Action

Alternate Alignments	Permanent Impacts
TCH-1*	37
TCH-2	62
TCH-3	138
TCH-4	94

* Preferred Alignment

The Border Infrastructure System would result in the reduction of illegal immigration and drug trafficking within this area. This would, in turn, reduce the crime in the area and would encourage development within the area. Planned land use within Area I is designated as low-density residential use. Future land use in the surrounding area includes light industrial uses to the west-northwest. The Border Infrastructure System may encourage development of the area and result in additional development adjacent to Area I. The amount of development that would occur is unpredictable at this time, but would depend on a variety of factors, including regional development patterns, local population growth, light industrial growth in the area, and other factors, such as the proposed extension of State Route (SR) 125.

4.3.3.2 Area V – Smuggler's Gulch

According to SANDAG, land use within Area V is designated as vacant, not graded land and extractive industry. The existing land use is consistent with this classification. Implementation of the proposed action would not significantly change or conflict with the existing land use classification.

Under the Proposed Action using the preferred alignment of SG-1, direct impacts from construction would affect approximately 92 acres. Of these 93 acres, SANDAG (2002) classifies existing land use as approximately 10 acres of extractive industry and 46 acres of vacant land, with the remaining as open space reserves.

The affected acreages in Area V for each of the alternate alignments would vary from 76 to 92 acres. The difference in these footprints would occur in the bottom of Smuggler's Gulch (which is classified as undeveloped lands) and on either side of Smuggler's Gulch due to different cut slopes. Alignment SG-4 would impact the least amount of land, but would require a 20 percent vertical grade on both sides of Smuggler's Gulch. The preferred alignment (SG-1) would allow a 10 percent grade and impact approximately 17 more acres than alignment SG-4. This additional amount is primarily due to the incorporation of side slope access roads, as well as a sedimentation basin and energy dissipaters at the outfall of the drainage structure for the SG-1 alignment and design.

4.3.3.3 Area VI – Bunker Hill

According to SANDAG, land use within Area VI is designated as open space reserves, preserves, and vacant, not graded land. Existing land use is consistent with this classification. Implementation of the proposed action would not significantly change or conflict with the existing land use classification north of the proposed tertiary fence.

Affected acreages in Area VI for each of the alternate alignments are shown in Table 4-9. Impacts within each of the alternate alignments within Area VI are discussed in the following paragraphs.

Table 4-9. Acres Impacted in Area VI under the Proposed Action

Alignment	SANDAG Land Use Classification	Acres Permanent
BHPO-1	Open Space Reserves, Preserves	6
	Vacant, not graded land	17
	TOTAL	23
BHPO-2	Open Space Reserves, Preserves	41
	Vacant, not graded land	14
	TOTAL	55
BHPO-3	Open Space Reserves, Preserves	31
	Vacant, not graded land	14
	TOTAL	45
BHPO-4 (preferred)	Open Space Reserves, Preserves	28
	Vacant, not graded land	5
	TOTAL	33

4.3.3.3.1 BHPO-1

Under the BHPO-1 alignment, direct impacts from construction would permanently convert approximately 23 acres of land to the proposed Border Infrastructure System. Of these 23 acres, approximately six acres of open space reserves, preserves, and 17 acres of vacant, not graded land would be converted to the proposed Border Infrastructure System.

4.3.3.3.2 BHPO-2

Direct impacts from construction required by Alignment BHPO-2 would permanently convert approximately 55 acres of land to the proposed Border Infrastructure System. Of these 55 acres, approximately 24 acres of open space reserves, preserves, and 31 acres of vacant, not graded land would be converted to the proposed Border Infrastructure System.

4.3.3.3.3 BHPO-3

Direct impacts from construction required by Alignment BHPO-3 would permanently convert approximately 45 acres of land to the proposed Border Infrastructure System. Of these 45 acres, approximately 15 acres of open space reserves/preserves and 30 acres of vacant, not graded land would be converted to the proposed Border Infrastructure System.

4.3.3.3.4 BHPO-4

Approximately 33 acres of land would be permanently converted to the proposed Border Infrastructure System under alignment BHPO-4, the preferred alignment. These 33 acres consist of approximately 28 acres of open space reserves/preserves and 5 acres of vacant, undeveloped land. Although this alignment would affect about 40 percent more acres (23 vs. 33) than alignment BHPO-1, INS/USBP decided to use alignment BHPO-4 to avoid impacts to the Border Field State Park. This decision was made in consideration of several comments received from the public on the Draft EIS. While the park area would be encompassed by the Border Infrastructure System, the land use would remain the same. Visitors would be allowed unlimited access to Monument Mesa and Friendship Circle during normal park hours (i.e., daylight). During the nighttime, when the park is typically closed, the USBP would use this area as part of the enforcement zone.

4.3.4 Fish and Wildlife Resources

4.3.4.1 Vegetation

The Proposed Action Alternative, using the preferred alignments, would result in permanent alteration of 37 acres in Area I, 92 acres in Area V and 33 acres in Area VI. The following paragraphs will discuss the anticipated effects of the various alignments within each of the project areas.

As depicted in Figure 4-6, the alignment that would result in the largest impact in Area I would be Alignments TCH-3 and TCH-4. The enforcement footprint for both of these alignments are similar; the primary difference is that TCH-4 includes a switchback on Tin Can Hill, so that use of the entire area north of Tin Can Hill would not be required for enforcement purposes.

Alignment TCH-1 in Area I (the preferred alignment) would result in less acreage (37 acres) than TCH-2 (62 acres), TCH-3 (138 acres), or TCH-4 (94 acres) within Area I. Under any of these alignments, the coastal sage scrub community would be the most affected. However, the TCH-1 alignment also contains the greatest percentage (24 percent) of disturbed vegetation communities, including bare ground, of the remaining alignments.

As can be seen from Figure 4-7, the preferred alignment (SG-1), Area V would result in more impacts than the other viable alignments. This additional acreage was required to allow the access roads to be constructed on both slopes of the embankments and to incorporate energy dissipaters and sedimentation basins at the discharge outfall. These ancillary facilities would enhance erosion control and maintenance activities that will help to ensure the stability of the slope and alleviate downstream water quality effects. The other alignments in this project area do not include these environmental design features.

Figure 4-6. Permanent Impacts to Vegetation in Area I under Proposed Action Alternative

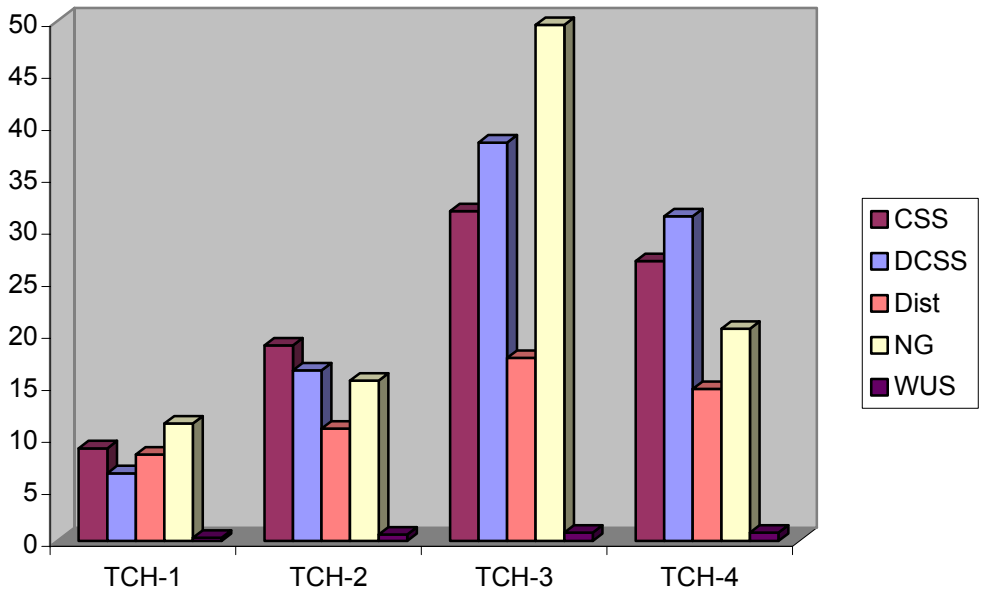
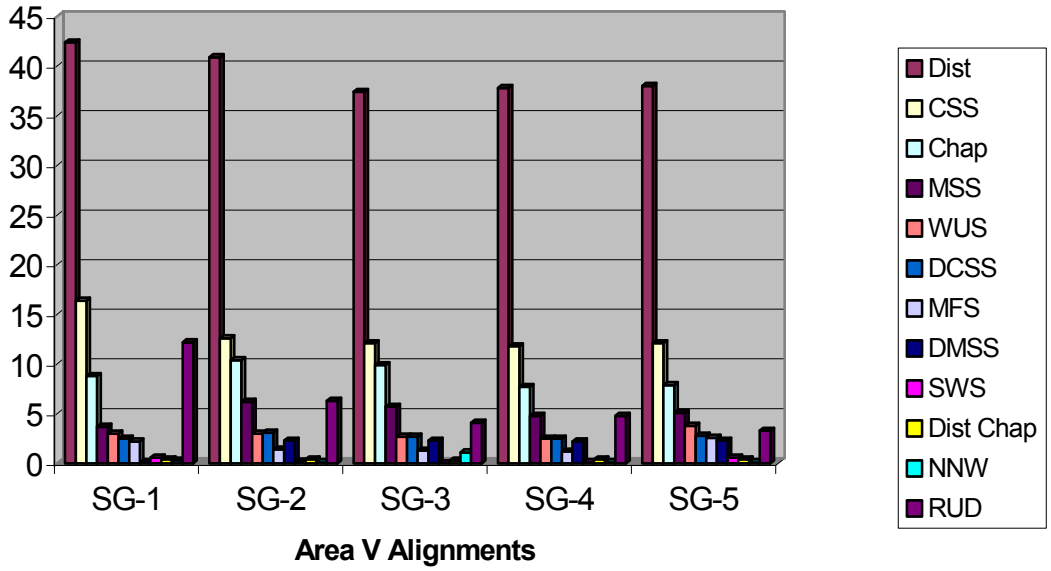


Figure 4-7. Permanent Impacts to Vegetation in Area V under Proposed Action Alternative and Preferred Alignment (SG-1)



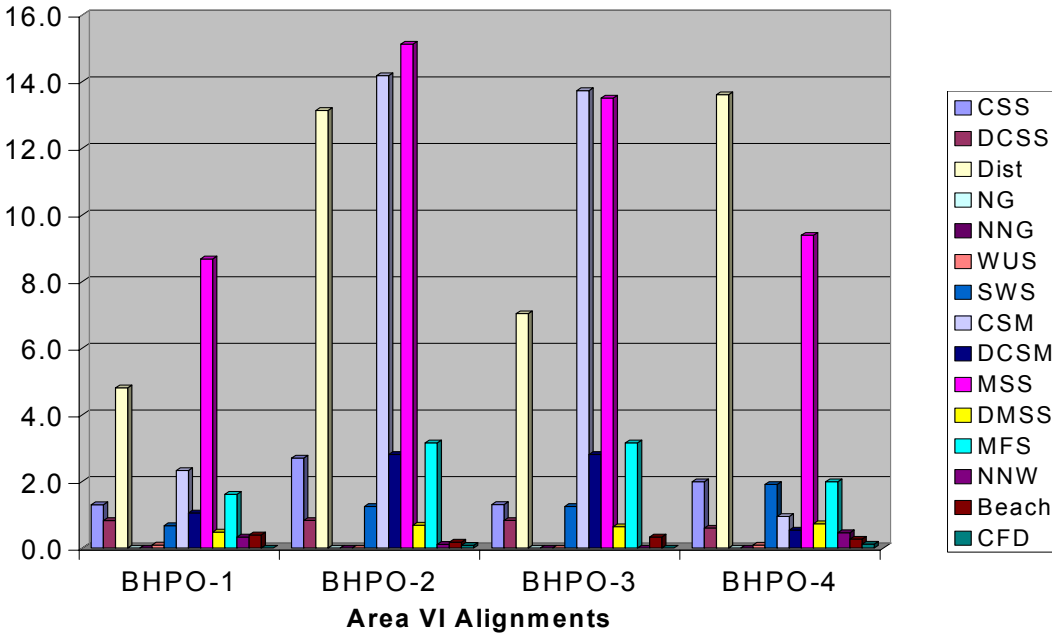
Dist = disturbed
CSS = coastal sage scrub
Chap = chaparral
NNG = non-native grasslands
MSS = Maritime succulent scrub
WUS = Waters of the U.S.
CSM = coastal salt marsh
DCSS = disturbed coastal sage scrub
MFS = mulefat scrub
DMSS = disturbed maritime succulent scrub
SWS = southern willow scrub
Dist Chap = disturbed chaparral
NNW = non-native woodlands
DCSM = disturbed coastal salt marsh

Regardless of the alignment, the majority of the area to be impacted has been previously disturbed or is ruderal. There is little difference in impacts to the remaining community types among the alignments, with the exception of the coastal sage scrub and mulefat scrub habitats. One of the alignments that would result in the least total impact (SG-5), however, would have greater impacts to mulefat communities and WUS (2.6 and 3.8 acres, respectively) as the preferred alignment. In addition, this alignment would produce the same impacts to southern will scrub communities (0.3 acres).

Impacts to vegetation in Area V would be about 92 acres under the preferred alignment (SG-1); however, about 42 acres (46 percent) of the 92 acres are classified as disturbed. Thus, about 50 acres of lands supporting vegetation communities would be altered if the Proposed Action Alternative were implemented. Over 75 percent of the vegetated acres is comprised of coastal sage scrub (16 total acres), chaparral (9 total acres), and ruderal (12 acres). Figure 4-7 depicts the habitat types that would be affected by the proposed action in Area V.

Permanent impacts to vegetation in Area VI (Figure 4-8) would range from 23 to 55 acres among the various alignments. The preferred alignment (BHPO-4) would impact about 33 acres, of which about 7 acres encompasses the day use area on top of Monument Mesa. This area is already disturbed and no further alterations would occur. Thus, the impacts to natural vegetation communities would be virtually the same as BHPO-1, which has the least amount (23 acres) of impact lands.

Figure 4-8. Permanent Impacts to Vegetation in Area VI



Dist = disturbed
CSS = coastal sage scrub
Chap = chaparral
NNG = non-native grasslands
MSS = maritime succulent scrub
WUS = Waters of the U.S.
CSM = coastal salt marsh
DCSS = disturbed coastal sage scrub
MFS = mulefat scrub
DMSS = disturbed maritime succulent scrub
SWS = southern willow scrub
Dist Chap = disturbed chaparral
NNW = non-native woodlands
DCSM = disturbed coastal salt marsh

Alignment BHPO-2 would cause the greatest impact (54.1 acres), followed by Alignment BHPO-3 (45.2 acres). The majority of this acreage for both alignments would consist of coastal salt marsh (14.2 and 13.7 acres, respectively). Alignment BHPO-1 would impact about 23 acres, comprised mostly of maritime succulent scrub (8.7 acres) and disturbed lands (4.8 acres). As mentioned above, alignment BHPO-4 (preferred alignment) would impact similar habitat types and quantities as BHPO-1. Figure 4-8 illustrates the differences in the permanent impacts associated with each alignment within Area VI.

Table 4-10 provides a summary of the impacts to the vegetation communities that would occur under the Proposed Action Alternative for each alignment in each area. Indirect adverse effects to vegetation communities could occur from induced land development and erosion/sedimentation actions. The lands north of the Border Infrastructure System in Areas II and III have already experienced commercial and private developments, as the area has become more secure from illegal aliens and smugglers. As the Area I Border Infrastructure System is completed, and the lands become even more protected, additional development would be expected. However, it should be noted that the lands north of the Border Infrastructure System in Areas I, II, and III have been, for the most part, previously disturbed by agricultural practices and consist primarily of non-native grasslands. The only lands in these areas that were initially identified for inclusion to the MSCP (which is indicative of their quality) are located near the intersection of La Media Road and Siempre Viva and in Spring

Canyon. Other "amended" lands on Otay Mesa have been subsequently identified for incorporation to the MSCP. It is therefore presumed that these areas would be preserved. It is highly unlikely that induced development would occur in Areas IV, V and VI due to the steep terrain, the existing property owners (public agencies), and the fact that most of the flat lands are located in floodplains.

Erosion and consequent sedimentation could indirectly impact vegetation communities. The magnitude of this effect would depend upon several issues, including the efficacy of the erosion control measures installed, soil types, climatic conditions, severity of the slopes, and conditions of the adjacent vegetation communities. The potential of these effects would be higher in those areas where significant cut-and-fill activities are planned (i.e., west side of Tin Can Hill, Smuggler's Gulch, and Lichty Mesa). INS would develop a SWPPP that would be implemented during the construction phase to ensure that erosion is minimal. It is obviously in the best interest of the INS to eliminate the potential for erosion as quickly as possible to protect the slopes of the road and fence platform. All of the areas contained within the construction footprint would be re-seeded with native species immediately upon completion of the construction in that area. The vegetation communities would be expected to begin to return to pre-project conditions within the third year after the revegetation efforts. The length of time required for complete restoration would depend upon the various biotic and abiotic variables, including soil types, climatic conditions, seed purity, quality of adjacent habitat, and type of habitat being restored. Thus, these effects should be considered temporary and insignificant.

Mitigation measures that would be incorporated to the final design and construction of the Border Infrastructure System are discussed in Section 5. Measures such as brow ditches, sedimentation traps and stilling basins, and energy dissipaters, in addition to revegetation measures, would be incorporated into the final engineering designs of cut-and-fill slopes, such as Smuggler's Gulch, to ensure long-term stability of the slope and to control erosion and sedimentation. The vast majority (90–95 percent) of the sediment entering the Tijuana estuary is derived from Mexico. The construction activities would temporarily add to this sediment load; however, upon completion of the structures and establishment of vegetation communities, the sedimentation loads would be less than the current sediment loads that are being transported from the extant road network and open channel at the bottom of Smuggler's Gulch. Baker (2003) reported that the completed slopes at Smuggler's Gulch would result in a 27 percent net decrease of sediment that would enter the Tijuana estuary under existing conditions. Baker calculated that the reduction in average annual load of sediment generated from the project would be about 796 tons. A copy of Baker's report is included in Appendix G. The current road network contains only limited erosion control measures and thus, contributes to the sedimentation problem in the estuary. Completion of the Border Infrastructure System would substantially improve the erosion/sedimentation control on the slopes of Smuggler's Gulch and Goat Canyon, provide some reduction of sediment loads from Mexico at the outfall structures, and allow extant patrol roads to be abandoned and revegetated.

Indirect benefits to vegetation communities north of the proposed secondary fence would be similar to those described in the Tactically Optimum Alternative. In addition to the protection afforded by the infrastructure system, and the revegetated slopes, hundreds of patrol roads currently used by USBP agents could be abandoned.

As will be discussed in Section V, the USBP has estimated that over 100 miles of dirt/gravel roads that are currently used for patrol and enforcement activities could be abandoned and revegetated with native species. Assuming each of these roads is 12 ft wide, these mitigation measures could provide approximately 145 acres of additional vegetation north of the Border Infrastructure System. The ability to provide this restoration,

.

Table 4-10. Summary of Permanent Impacts (Acres) to Vegetation From Alignments of Proposed Action Alternative[1]

Habitat Types	Area I Alignments				Area V Alignments					Area VI Alignments			
	TCH-1*	TCH-2	TCH-3	TCH-4	SG-1*	SG-2	SG-3	SG-4	SG-5	BHPO-1	BHPO-2	BHPO-3	BHPO-4*
Coastal Sage Scrub (CSS)	7.9	18.8	31.7	26.9	16.4	12.6	12.1	11.8	12.1	1.3	2.7	1.3	2.0
Disturbed Coastal Sage Scrub (DCSS)	6.2	16.4	38.3	31.2	2.5	3.1	2.7	2.5		0.8	0.8	0.8	0.6
Native Grassland (NG)	13.8	15.4	49.6	20.4									
Southern Willow Scrub (SWS)					0.3	0.2	0	0.1	0.3	0.7	1.2	1.2	1.9
Waters of the U.S. (WUS)	0.2	0.6	0.8	0.8	3.0	3	2.7	2.5	3.8	0.1			
Chaparral (Chap)					9.0	10.4	9.9	7.7	7.9				
Disturbed Chaparral (Dist Chap)					0.2	0.4	0.3	0.4	0.4				
Mulefat Scrub (MFS)					2.2	1.4	1.3	1.2	2.6	1.6	3.2	3.2	2.0
Coastal Salt Marsh (CSM)										2.3	14.2	13.7	1.0
Disturbed Coastal Salt Marsh (DCSM)									2.8	1.0	2.8	2.8	0.5
Maritime Succulent Scrub (MSS)					3.7	6.2	5.7	4.8	5.1	8.7	15.1	13.5	9.4
Disturbed Maritime Succulent Scrub (DMSS)					0.1	2.3	2.3	2.2	2.3	0.5	0.7	0.6	0.7
Non-Native Woodland (NNW)					0.3	0.1	1.1	0.1	0.1	0.3	0.1		0.5
Beach (Beach)										0.4	0.2	0.3	0.2
Ruderal (RUD)					12.2	6.3	4.1	4.8	3.3				
Disturbed (Dist)	9.2	10.8	17.6	14.6	42.4	40.9	37.4	37.8	38	4.8	13.1	7.0	13.6
TOTAL ACRES	37.3	62	138.0	93.9	92.3	87.0	79.6	75.9	78.7	22.5	54.1	44.4	32.7

[1]Blank cells = 0 acres permanently impacted; other temporary impacts would occur during construction
*Preferred Alignment

however, will be dependent upon completion of the Border Infrastructure System and permission from the current landowners.

4.3.4.2 Wildlife

Since the impacted areas are a fairly narrow corridor along disturbed areas and better habitat is located immediately north of the impact areas, the Proposed Action Alternative would present similar impacts to wildlife as those found in the Tactically Optimum Alternative. For instance, the wildlife within the project area would potentially be displaced due to the lack of habitat; however, as previously mentioned, this impact would be minimal. Even though the area between the patrol road and primary fence could be much smaller under this alternative, some limited habitat would be expected to become established, especially on the cut-and-fill slopes north of the Border Infrastructure System. The reduced habitat would support a smaller population of birds, rodents and reptiles; however, the rate of accidental deaths from the patrol vehicles would probably increase, since the more narrow corridor would reduce the opportunity to escape.

As the areas north of the project locations are no longer used by USBP for patrol and apprehension efforts, and the amount of illegal traffic diminishes, the native vegetation should be able to reestablish itself and provide better habitat for any wildlife that would be displaced by the Border Infrastructure System. The different alignments in this alternative would provide for varying amounts of habitat to be impacted, but the impacts to the wildlife would be similar to those effects discussed in Section 4.2.4.2.

4.3.5 Unique and Environmentally Sensitive Areas

4.3.5.1 MSCP

Implementation of the proposed action would allow USBP to abandon some of their existing patrol roads. The abandonment of these patrol roads and subsequent revegetation of these roads would directly benefit existing MSCP lands within the project region. Direct benefits include improved aesthetic value to MSCP lands, improved wildlife habitat on MSCP lands, and improved recreational opportunities on these lands.

The Proposed Action would involve the elimination of lands proposed for inclusion in the MSCP preserve. As discussed in Section 3.3.5, the MSCP was a multi-agency agreement developed under Section 10 of the ESA to identify lands for future conservation. The intent of the program is to enhance biodiversity, preserve habitats that support protected species, and enhance contiguity of habitat areas. Another objective was to reduce time and efforts required for formal ESA consultation for future development projects. The INS/USBP did not participate in the development of this valuable program and thus was not a signatory partner. Although the INS/USBP have made every attempt to reduce the effects on MSCP lands, while satisfying the stated purpose and need as well as IIRIRA. There is no statutory requirement for the INS to comply with the mitigation conditions specified in the MSCP. Consequently, there is a potential that INS's lack of participation in the MSCP could affect or influence other Federal, state, and local agencies' future participation as well. INS has stated its intentions, however, to preserve or transfer approximately 145 acres in the Spring Canyon area to a conservation agency upon completion of the Border Infrastructure System as partial mitigation for protected species. These lands are included in the MSCP and could be used as such by the receiving agency.

4.3.5.1.1 Area I – Tin Can Hill

Currently, there are no MSCP lands in Area I; therefore, no impacts to MSCP lands are anticipated. However, some of the lands composing Area I are included in the MSCP as

a major amendment area to the County of San Diego's Sub-area Plan. Conservation levels for these areas and inclusion in the MSCP are anticipated in the future.

4.3.5.1.2 Area V – Smuggler's Gulch

Under the preferred alignment of the Proposed Action Alternative, approximately 88 acres of land in which the MSCP preserve may be created would be permanently removed from potential conservation. The other alignments would impact varying amounts of MSCP lands, ranging from 72 acres (SG-4) to 82 acres (SG-2).

4.3.5.1.3 Area VI – Bunker Hill

Affected acres of MSCP preserve lands in Area VI for each of the alternate alignments are shown in Table 4-11. As can be seen from this table, alignments BHPO-2 and BHPO-3 would affect the greatest amount of MSCP lands. This is because both alignments follow the southern edge of Monument Road westward to Monument Mesa and all lands between the secondary and primary fences would be considered impacted by the Border Infrastructure System.

Of the four alternate alignments, BHPO-4 would have the least direct impact on the MSCP lands. Based upon public sentiment and the INS's desire to reduce recreational and social effects, the INS elected to use the BHPO-4 alignment as the preferred alignment. This alignment would contain about nine more total acres than BHPO-1; however, these areas consist of the developed park area on top of Monument Mesa, which are not MSCP lands.

Table 4-11. MSCP Lands (Acres) Impacted in Area VI Under the Proposed Action

Alignment	Permanent Impact
BHPO-1	17
BHPO-2	33
BHPO-3	34
BHPO-4*	16

* Preferred Alignment

4.3.6 Protected Species and Critical Habitats

Implementation of the Proposed Action would have impacts to Federally listed species in Areas V and VI and to critical habitat in Area I. Detailed information about impacts to the species, and potential mitigation for these impacts, is provided in a BA that has been prepared and submitted to the USFWS as part of formal Section 7 consultation. A copy of the BO, which resulted from this consultation, is contained in Appendix H. The following paragraphs will summarize the effects to Federally threatened and endangered species, as well as state listed species.

Specimens of some species, particularly some of the plants, could be salvaged and relocated to avoid impacts. A conceptual plan for salvaging the Baja California birdbush is included in Appendix G. Others, such as burrowing owls, could be avoided by scheduling work during non-breeding and nesting seasons or relocation.

Indirect effects, both beneficial and adverse, would occur to some Federal and state listed species. Induced development north of the tertiary fence would occur as the area becomes more secure. These effects would be more probable in Areas I, II, and III, which

contains habitat that potentially support Quino checkerspot butterfly, San Diego and Riverside fairy shrimp, Otay Mesa mint, Otay tarplant, and San Diego thornmint.

Indirect beneficial effects would also result from the reduction or elimination of illegal traffic and consequent USBP apprehension efforts north of the Border Infrastructure System. These areas have experienced significant damage caused by illegal aliens and smugglers (see photographs 1-1 and 1-4 of Chapter 1). The border infrastructure would virtually eliminate illegal alien/smuggler and USBP traffic in these areas, allowing public land managers, particularly in Areas V and VI, to manage for the protected species more intensively.

4.3.6.1 Area I – Tin Can Hill

No direct impacts to Federally listed species would occur, since no species have been reported in the Area I project corridor. However, Area I is located within designated critical habitat for the coastal California gnatcatcher and the Quino checkerspot butterfly. Implementation of the proposed action would alter about 37 acres of critical habitat. Mitigation measures to offset these losses would include revegetation of abandoned roads and acquisition or transfer of lands to a resource agency (see Appendix H). In addition, as indicated in Table 4-12, some state-listed species and/or their habitat would be affected. Under this alternative, Alignment TCH-I would have the least impact to Federal and state-listed species. Alignments TCH-3 and TCH-4 would have the same impacts to species and would have the greatest impacts with regards to species diversity and individual species (Table 4-12). Most–if not all–of the impacts to these species could be avoided by relocation and/or scheduling activities.

Table 4-12. Protected Species and Number of Individuals Affected in Each Alignment in Area I for the Proposed Action Alternative

Species Affected	Alignment TCH-1*	Alignment TCH-2	Alignment TCH 3	Alignment TCH 4
Burrowing owl	2	2	22	2
San Diego sunflower		4	18	11
Spiny rush			5	6
Tecate cypress			1	1

Source: AMEC 1999and 2001. *Preferred Alignment

In Area I, 37 acres of Quino checkerspot butterfly critical habitat would be impacted. Of this, 8.3 acres consist of roads and other denuded areas that provide no primary constituent elements for this species. The remaining area consists of disturbed coastal sage scrub and native and non-native grasslands, which provided limited suitable habitat or primary constituent elements for Quino checkerspot butterfly. Some patches of dwarf plantain were recently reported within the project corridor by the USFWS (DeGregoria 2003). The closest observation of Quino checkerspot butterfly has been on the north side of Tin Can Hill, near the TCH-3 alignment. This location is approximately 0.25 miles from the TCH-1 alignment footprint.

About 37 acres of coastal California gnatcatcher critical habitat would also be impacted in Area I, which overlaps the Quino checkerspot butterfly critical habitat. The gnatcatcher inhabits the coastal sage scrub habitat. Much of this type of habitat in the project footprint is very disturbed and was deemed too disturbed to provide quality gnatcatcher habitat (USACE 1999a). During sensitive species surveys performed in 1999 and 2001 for the gnatcatcher, no birds were observed in Area I (AMEC 1999 and 2001).

This area contains limited, if any, of the gnatcatcher's primary constituent elements required for suitable habitat.

4.3.6.2 Area V – Smuggler's Gulch

The Proposed Action Alternative would affect habitat within Smuggler's Gulch that is known to be occupied by least Bell's vireo. During the 2001 surveys, two vireos were recorded in this area. Given the amount of cut-and-fill activities required at Smuggler's Gulch, impacts to this habitat are unavoidable. In addition, at most, a total of 4,004 individual specimens of seven different state-listed species would be impacted. San Diego sunflower and barrel cactus would be the species most affected. None of the Federally listed species have critical habitat located within this area. More information is contained in the BO presented in Appendix H.

Species and number of individuals affected in each area are presented in Table 4-13. Under the Proposed Action Alternative, there is no substantial difference in the numbers of species affected for each of the alignments. The San Diego sunflower would have the most individuals affected for any alignment. However, impacts to the least Bell's vireo would be unavoidable under any of the alternatives. Approximately 2.5 acres of mulefat scrub and southern willow scrub considered to be occupied habitat would be impacted by the preferred alignment. If the alignment SG-4, which would result in fewer total acres of impact, were selected, the impacts to least Bell's vireo habitat would be 2.9 acres.

Table 4-13. Protected Species and Number of Individuals Affected in Area V for the Proposed Action Alternative

Species Affected	Alignment SG-1*	Alignment SG-2	Alignment SG-3	Alignment SG-4	Alignment SG-5
Baja California birdbush	47	45	42	42	42
Barrel cactus	663	574	502	461	533
Cliff spurge	483	368	313	289	328
Least Bell's vireo	2	2	2	2	2
Orcutt's bird's-beak	71	45	45	45	30
San Diego sunflower	2,276	1,931	1,655	1,429	1,579
White lilac	65	66	63	63	70

Source: AMEC 1999 and 2001
* Preferred Alignment

4.3.6.3 Area VI – Bunker Hill

Each of the alignments in Area VI under the Proposed Action alternative would result in impacts to least Bell's vireo habitat. The least Bell's vireo occupies small patches of coastal sage scrub and maritime succulent scrub on the western slope of Bunker Hill. Under alignments BHPO-2 and BHPO-3, impacts would also occur to coastal California gnatcatcher. Species and number of individuals affected in each alignment are presented in Table 4-14. Under this alternative, Alignment BHPO-3 would have the most impact to state-protected species. Alignments BHPO-1 and BHPO-4 would have the least amount of impacts to individuals of protected species. Impacts to least Bell's vireo would be unavoidable under any of the alignments. However, alignments BHPO-1 and BHPO-4 (preferred alignment) would eliminate direct impacts to gnatcatchers. Thus, by implementing the preferred alignment (BHPO-4), impacts to protected species would be mitigated.

The snowy plover has 1 acre of designated critical habitat located within this area. However, no direct impact would occur due to INS electing to tie the Border Infrastructure System into the existing primary fence on the western slope of Monument Mesa. More information is contained in the BO presented in Appendix H.

Table 4-14. Protected Species and Number of Individuals Affected in each Alignment in Area VI for the Proposed Action Alternative

Species Affected	Alignment BHPO-1	Alignment BHPO-2	Alignment BHPO-3	Alignment BHPO-4*
	Number	Number	Number	Number
Barrel cactus	64	66	66	64
Coastal agave	298	338	338	238
Goldenspined cereus		4	4	
Least Bell's vireo	2	2	2	2
Orcutt's dudleya		566	566	
Snake cholla	246	253	253	254
South coast saltscale		67	67	
Coastal California gnatcatcher		1	1	

Source: AMEC 1999
* Preferred Alignment

4.3.7 Cultural Resources

Cultural resources sites would be unavoidably affected by the Proposed Action Alternative, regardless of the alternate alignment. The preferred alignment in each project area is the alignment that more closely parallels the international border, with the exception of the BHPO-4 alignment in Area VI. Consequently, the number of sites anticipated to be impacted by the preferred alignments would be the same or less than the other alternate alignments. The BHPO-4 alignment encompasses more land on the western end of the project area, but actually avoids the cultural resources site on top of Monument Mesa. Potential impacts to cultural resources, by project area, are discussed in the following paragraphs.

4.3.7.1 Area I – Tin Can Hill

Three sites (CA-SDI-8653, CA-SDI-14,726, CA-SDI-14,727) within the TCH-1 alignment have no identifiable cultural resource deposits remaining in the proposed construction footprint, therefore, they would not be impacted by the proposed action. In addition, sites CA-SDI-8652, CA-SDI-12,718, and CA-SDI-12,720/CA-SDI-14,725 have been determined through testing to be ineligible for inclusion in the NRHP (see Table 3-4), and would therefore not be compromised by the proposed construction within the preferred alignment (TCH-1).

The cut-and-fill activities proposed in this area would directly or indirectly impact the following sites: Site CA-SDI-15,041, Site CA-SDI-12,703, and Site CA-SDI-15,042. These sites are currently considered to be of unknown eligibility for inclusion in the NRHP, and should be tested in order to evaluate their NRHP status. The other three alignments would impact these three sites, as well as the remaining four sites that area of unknown eligibility (see Table 3-4).

4.3.7.2 Area V – Smuggler's Gulch

Area V contains seven recorded cultural resource properties (see Table 3-5). Three of the sites have disappeared, and are thought to have been destroyed. Of the remaining four, two have been tested and are considered ineligible for inclusion in the NRHP, and two have been surveyed and are considered to be ineligible. Therefore, no historic properties would be affected in Area V under the Proposed Action Alternative regardless of the alignment.

4.3.7.3 Area VI – Bunker Hill to Pacific Ocean

Area VI contains five recorded cultural resource properties, (see Table 3-6). One of the sites (CA-SDI-15,039) has been tested and is considered to be ineligible for inclusion in the NRHP. Site CA-SDI-15,038 is located near the southern border of the project corridor. This site has not been evaluated and is considered as having unknown eligibility for inclusion in the NRHP. Site CA-SDI-3627, the Bunker Hill Site, has both prehistoric and historic components and is considered to be potentially eligible for the NRHP, but would require archival research and testing to determine that status. Two early prehistoric sites, CA-SDI-4281 and CA-SDI-222, are currently eligible for listing or are already listed on the NRHP.

4.3.7.3.1 BHPO-1

The BHPO-1 alignment is a parallel fence and patrol road that starts at the toe of the western slope of Bunker Hill and crosses Lichty Mesa and then transects the Monument Mesa of the Border Field State Park (see Figure 2-10). This alignment includes different designs for crossing Lichty Mesa including cut-and-fill activities and fill and capping measures as described previously in Section 2.2.3.3.1. The fill and capping designs were selected to preserve sensitive cultural resources that occur on top of Lichty Mesa. The alignment on top of Lichty Mesa was also shifted southward to the minimum distance of 150 ft for the construction footprint to avoid environmentally sensitive plant communities that occur along the north and northwestern edges of Lichty Mesa.

An earthen embankment constructed within Yogurt Canyon would connect Lichty Mesa and Monument Mesa of Border Field State Park to allow the road and fence platform to continue in a straight alignment. The tertiary fence and road platform would end at the intersection of the western slope of the day use area and the Pacific Ocean beach.

Under this alternative, testing of site CA-SDI-15,038 would be required to determine its NRHP eligibility status. Mitigation measures would have to be implemented should the site prove to meet the eligibility criteria. The Bunker Hill Site, CA-SDI-3627, is potentially eligible for the NRHP. Options for road improvements going to the top of the hill would require avoidance and archaeological monitoring during construction. This alternative would require mitigation measures be undertaken on eligible and listed sites CA-SDI-4281 and CA-SDI-222. The capping and fill measures noted previously for Lichty Mesa would be part of the mitigation of impacts to the site.

4.3.7.3.2 BHPO-2

This alignment would be operationally and tactically effective and would eliminate the need to cap Lichty Mesa and the potential impacts to the day use area's usable area. The amount of fill material to construct the road/fence platform would be significantly reduced under this design.

Under this alternate alignment, indirect impacts would occur to site CA-SDI-4281, due to pedestrian and vehicular traffic. Site CA-SDI-222 already lies underneath Border Field State Park and has been impacted by roads, bathrooms, park benches and picnic tables, and walkways along the edge of the Monument Mesa.

4.3.7.3.3 BHPO-3

Under this alternate alignment, indirect impacts would occur on two sites: CA-SDI-4281 and CA-SDI-15,038, due to illegal pedestrian and vehicular traffic at the site. Site CA-SDI-222 already lies underneath Border Field State Park and has been impacted by roads, bathrooms, park benches and picnic tables, and walkways along the edge of Monument Mesa. However, the site would be directly impacted by this proposed alternative and possible excavation or other measures would be required to mitigate project impacts.

4.3.7.3.4 BHPO-4

The potential project impacts associated with this preferred alignment would require testing of site CA-SDI-15,038 to determine its NRHP eligibility status, and perhaps mitigation measures, should the site prove to meet the eligibility criteria. The Bunker Hill Site, CA-SDI-3627, is potentially eligible for the NRHP. Options for road improvements going to the top of the hill would require avoidance and archaeological monitoring during construction. This alternative would require mitigation measures be undertaken at eligible and listed sites CA-SDI-4281 and CA-SDI-222. Impacts to CA-SDI-222 under this alternative would be indirect. The capping-and-fill measures noted previously for Lichty Mesa (under BHPO-1) would be part of the mitigation of impacts to the site.

4.3.8 Air Quality

4.3.8.1 Construction

Air quality impacts from construction include emissions from heavy equipment exhaust and fugitive dust. In addition, emissions from the transport of workers and materials to and from the construction sites are also included. Construction emissions are estimated separately for earthwork (cut-and-fill activities), roadway, lighting, and fencing construction. Emissions from fugitive dust of vehicles traveling to and from the site on unpaved roads and exhaust from highway vehicles are also calculated separately. The assumptions used in quantifying these emissions and a breakdown of emissions by each of these activities was provided in Appendix D of the Draft EIS.

Construction emissions result from earthwork, including grading of the site and cut-and-fill activities. Due to the hilly terrain in the area and the need for a functionally effective alignment, the quantity of earthwork required is extensive for many of the proposed alignments. Emissions from construction of the roadway, lighting, and fencing infrastructure are typically small in comparison to the earthwork contribution, particularly for Area I and Area V, which require large amounts of cut-and-fill. Exhaust emissions from worker and delivery material vehicles are also small in relation to the earthmoving construction activities. Finally, the contribution of fugitive dust emissions from unpaved roadway travel is small in comparison to fugitive dust emissions from on-site construction activities.

4.3.8.1.1 Area I – Tin Can Hill

Table 4-15 summarizes total estimated emissions associated with construction activities for each of the proposed alignments for Area I. Emissions associated with alignments TCH-1 and TCH-2 are greatest due the excavation requirements associated with these two designs.

Table 4-15. Area I- Tin Can Hill
Estimated Emissions for Proposed Action Alternative (tons)

Alignment	CO	ROC	NOx	SOx	PM_{10}
TCH-1	7.4	0.9	15.5	1.4	171.8
TCH-2	7.5	0.9	15.7	1.4	171.6
TCH-3	5.0	0.6	10.0	0.9	148.6
TCH-4	5.5	0.7	11.1	1.0	197.2

CO = Carbon Monoxide
ROC = Reactive organic compounds
NOx = Nitrogen oxides
SOx = Sulfur oxides
PM_{10} = Particulate matter

4.3.8.1.2 Area V – Smuggler's Gulch

Table 4-16 summarizes total estimated emissions associated with construction activities for each of the proposed alignments for Area V. Similar emissions would be expected to be generated using the SG-1 and SG-2 alignments.

Emissions increase in scale with the increased requirement for earthwork, and increase most significantly with earthwork requiring the import of large quantities of fill from off-site (alignment SG-5). This adds the requirement of a large number of dump truck trips and significantly increases air emissions from vehicle exhaust.

Table 4-16. Area V- Smuggler's Gulch
Estimated Emissions for Proposed Action Alternative (tons)

Alignment	CO	ROC	NOx	SOx	PM_{10}
SG-1	18.1	2.2	39.8	3.5	355.2
SG-2	18.6	2.2	40.7	3.6	359.4
SG-3	15.8	1.9	34.4	3.0	355.4
SG-4	13.9	1.7	29.8	2.6	318.2
SG-5	74.7	12.2	293.1	24.0	1320.8

CO = Carbon Monoxide
ROC = Reactive organic compounds
NOx = Nitrogen oxides
SOx = Sulfur oxides
PM_{10} = Particulate matter

4.3.8.1.3 Area VI – Bunker Hill to Pacific Ocean

Table 4-17 summarizes total estimated emissions associated with construction activities for each of the proposed alignments in Area VI. Impacts increase with the amount of earthwork required for the various alignments, however, the earthwork required for this section is significantly less than that required for Areas I and V. While alignment BHPO-3, has the smallest impact, all impacts are well below significance criteria as defined by Federal conformity *de minimus* thresholds.

Significance thresholds for air quality impacts are based on *de minimus* thresholds for Federal conformity. Proposed actions with emissions below these thresholds are presumed to have negligible impacts and therefore are presumed to conform. As outlined in Section 3.8, these thresholds are developed for pollutants (and pollutant precursors) for which an area is in nonattainment or maintenance and are dependent on the severity of a region's air pollution problem. For the San Diego Air Basin, *de minimus* thresholds are 50 tons per year for ozone precursors (VOC and NOx) and 100 tons per year for CO.

Table 4-17. Area VI- Bunker Hill to Pacific Ocean
Estimated Emissions for Proposed Action Alternative (tons)

Alignment	CO	ROC	NOx	SOx	PM_{10}
BHPO-1	2.7	0.3	4.6	0.4	213.8
BHPO-2	2.9	0.3	5.0	0.4	213.7
BHPO-3	2.7	0.3	4.5	0.4	191.0
BHPO-4	3.0	0.3	5.3	0.5	196.9

CO = Carbon Monoxide
ROC = Reactive organic compounds
NOx = Nitrogen oxides
SOx = Sulfur oxides
PM_{10} = Particulate matter

For the purposes of evaluating project emissions on an annualized basis, it is assumed that construction of the Border Infrastructure System is staged with activity occurring only in one area at any time. It is further assumed that construction activities for the various proposed alignments for Area I (Tin Can Hill) and Area VI (Bunker Hill to Pacific Ocean) occur over approximately 14 and 10 months, respectively. A typical construction duration for Area V (Smuggler's Gulch) is estimated as 16 months for alignments SG-1 through SG-4 and estimated two years duration for earthmoving-intensive alignment option, SG-5.

Annual construction emissions are less than *de minimus* thresholds with the exception of alignment SG-5. If this design were to be carried forward, a Federal conformity analysis (consistent with SDAPCD Rule 1501) would need to be performed in order to demonstrate that the construction project and resulting emissions conform to the State Implementation Plan and would not impede progress towards achieving or maintaining the NAAQS. However, as indicated previously, alignment SG-1 is the preferred alignment for the Proposed Action Alternative. Construction of the Border Infrastructure System using alignment SG-1 would generate emissions below *de minimus* thresholds.

4.3.8.2 Operation

There would be no increase in the number of USBP agents or vehicles as the result of the implementation of the Proposed Action Alternative. This is irrespective of the alignments selected. Air quality impacts may actually decrease somewhat due to more effective vehicular patrol of the border area and roadway improvements that would minimize fugitive dust emissions. Therefore, there are no significant impacts that would result from the operation of the improved infrastructure system.

4.3.9 Water Resources

4.3.9.1 Surface Water

The potential effects to surface water bodies and water quality from implementation of this alternative would be similar to that described for the Tactically Optimum Alternative. Direct and indirect effects would be associated with erosion/sedimentation actions and/or accidental spills of POL. The BMPs required for compliance with the SWPPP and immediate response to any accidental spill would alleviate any potential effect to the level of insignificance.

The potential to have an effect is higher in Areas V and VI, which are closer to the ocean and the streams within the Tijuana estuary. All the drainages in Area I are ephemeral streams, so the potential to affect surface water quality exists only during storm events. Construction of the Border Infrastructure System at the Area I drainages have the potential to cause transboundary water quality effects during the construction activities.

Consequently, construction within these drainages would be scheduled during dry seasons to the extent practicable. In addition, BMPs would be implemented throughout the construction actions to reduce and/or control sediments flowing into Mexico, as discussed previously in Section 2. No contaminants, other than sediments and some naturally occurring heavy metals, would be expected to be generated during the construction. Due to the temporary and minor nature of these potential impacts, the construction would be considered to be in compliance with EO 12114.

Transboundary impacts would not occur as a result of the proposed Border Infrastructure System in Areas V and VI, since streams in these areas flow north from Mexico into the United States. Cut-and-fill activities would expose native soils to weathering, which could result in elevated heavy metals concentration in stormwater runoff. The magnitude of these effects are not known at the present, but are expected to be insignificant since native soils are currently exposed on both sides of the border in these drainages. Furthermore, the INS has committed to implementing BMPs, as would be developed in the SWPPP, to reduce erosion and sedimentation. Measures such as brow ditches, water bars, sedimentation traps, stilling basin, terracing, energy dissipaters, and revegetation measures shall be included in the final engineering design, as appropriate, to ensure soil and slope stability. These measures were discussed previously in Section 2 of the Final EIS. Furthermore, as discussed in Section 4.3.4.1, recent hydrological analyses indicate that the finished slopes of the Smuggler's Gulch embankment would reduce the sediments currently being transported from the project corridor into the Tijuana estuary. Thus, effects to water quality, if any, would be considered temporary. No long-term adverse effects to the State of California and USEPA's efforts to bring the Tijuana River and estuary into water quality compliance would result from implementation of the Border Infrastructure System. In fact, quality of water discharged through Smuggler's Gulch would be improved in the long term due to the erosion/sediment control measures that would be installed.

Direct and indirect impacts would be similar, regardless of which alignment was chosen. The magnitude would increase, however, as the construction footprint increases among the alignments. Still, effects to surface water quality would be considered minimal and temporary. The use of PennzSuppress®, or an equivalent product, would not affect surface water quality. This product is a petroleum-based resin, but it would be expected to bind with the aggregates used as road material. Any leaching that does occur would be non-toxic to fish and other aquatic organisms (see Appendix G). Effects to jurisdictional waters and wetlands are discussed later in Section 4.3.9.4.

4.3.9.2 Flood Peaks

Implementation of this alternative, regardless of the alignment selected, would have temporary and minor effects to flood flows due to the increased surface area and lack of vegetation during the construction phase. Once the slope surfaces become revegetated, surface runoff would return to or near pre-project conditions. Drainage structures would be designed to sufficiently convey stormwater flows. Impacts to 100-year flood plains in Areas V and VI are unavoidable. However, all structures that will be placed within these areas would be designed to convey the 100-year-flood event and not impede floodwaters or exacerbate flooding conditions. The alignments and designs selected under the Proposed Action Alternative would produce the least impacts to floodplains, while satisfying the stated purpose and need and complying with IIRIRA. Therefore, this action would be considered to be in compliance with EO 11988.

4.3.9.3 Groundwater Resources

As indicated in the previous alternative discussions, construction of the Border Infrastructure System, regardless of the design or alignment selected, would not affect

groundwater resources. Accidental spills would be appropriately managed and immediately reported to the County of San Diego, Department of Environmental Health, if greater than five gallons.

4.3.9.4 Waters and Wetlands of U.S.

Implementation of the Proposed Action would have varying impacts to WUS, including wetlands, depending upon the alignment selected. Impacts to WUS and wetlands are discussed by project area in the following subsections.

Beneficial, long-term, indirect effects would result from construction of the infrastructure system. Illegal foot and vehicle traffic would be eliminated in areas north of the tertiary fence. Based on review of aerial photography and ground reconnaissance, there are literally hundreds of trails that have been established by illegal aliens through the marshes within the Tijuana River estuary (see Photograph 1-3, Chapter 1). Assuming a conservative estimate that each of these trails are two ft wide (many are up to four ft wide) and transect the entire estuary (approximately 2.25 miles), 50 such trails would impact about 27 acres. In the absence of illegal foot traffic, these trails would be allowed to revegetate and regain the functional value as a coastal marsh. Conversely, without the Border Infrastructure System, these impacts would continue, and likely increase.

Impacts to WUS, including wetlands, resulting from the construction of proposed infrastructure would require coordination and 404 permit issuance from the USACE Los Angeles District. The USACE Los Angeles District would have to follow permit evaluation guidelines set forth in Section 404(b)(1) of the Clean Water Act, which requires the USACE to obtain justification and mitigation for all impacts to Waters of the U.S., including wetlands. Mitigation involves first trying to avoid impacts to the resource, secondly minimizing impacts to the resource, and thirdly providing compensatory mitigation for all unavoidable impacts to Waters of the U.S., including wetlands. Avoidance is determined first by demonstrating that the proposed project is water dependent, and secondly by demonstrating that the proposed project is the least environmentally damaging practicable alternative (LEDPA). Since the purpose and need is to develop an effective and defensible enforcement zone that substantially reduces the current enforcement footprint, impacts to Waters of the U.S. and wetlands would be unavoidable. Furthermore, IIRIRA mandates a 14-mile Border Infrastructure System parallel to the primary fence. Compliance with this Federal statute would require designs and construction activities that could not avoid impacts to drainages that flow northward or southward within this corridor, and their adjacent wetlands. The alignments selected under the Proposed Action in each area would result in the minimal impacts to Waters of the U.S. and wetlands, compared to all the other viable alignments and alternatives. Thus, the proposed Action Alternative and preferred alignment is also the LEDPA. A Section 404(b)(1) evaluation is contained in Appendix G.

The following paragraphs describe the potential impacts to WUS, including wetlands, that would occur within each project area. It should be emphasized that all potentially jurisdictional wetland areas located between the existing primary fence and the northern toe of the proposed construction footprint are included in this analysis. However, during the Section 404/401 permit process only those areas that would be affected by proposed dredge and fill activities would require a permit and consequent mitigation. Section 5.3 provides quantification of the direct and temporary wetland impacts that would fall under the authority of the Clean Water Act. Mitigation ratios for each wetland type are also discussed. It will also be demonstrated that although wetland impacts are unavoidable, the least amount of wetland impacts would occur using the preferred alignments under the Proposed Action. This alternative, therefore, would be considered to be in compliance with EO 11990.

4.3.9.4.1 Area 1 – Tin Can Hill

As can be seen from Table 4-18, TCH-1 would have the least permanent impact (approximately 0.3 acres) on WUS and TCH-4 would have the greatest permanent impact (approximately one acre) on WUS, including wetlands. TCH-4 is the only alignment that would impact Wetland 6, which is located in the extreme northern portion of the project corridor. The remaining alignments are located south of Wetland 6 and would only impact WUS trending north to south through the project corridor.

Table 4-18. Permanent Impacts to Waters of the U.S. including Wetlands in Area I under the Proposed Action

Wetland type	Permanent (acres)			
	TCH-1*	TCH-2	TCH-3	TCH-4
Southern Willow Scrub	0.0	0.0	0.00	0.2
Waters of the U.S.	0.3	0.6	0.8	0.7
Total	0.3	0.6	0.8	0.9

* Preferred Alternative

4.3.9.4.2 Area V – Smuggler's Gulch

Alignment SG-4 would result in the least amount of acreage (3.5 acres) of WUS, including wetlands being permanently impacted in Area V, while alignment SG-5 would result in the greatest amount of permanent impacts (5.7 acres) to WUS, including wetlands in Area V (Table 4-19). The location of the crossing at Smuggler's Gulch is the largest variance in the amount of impacts to WUS, including wetlands. Smuggler's Gulch widens as it trends north from the international border, thus increasing the jurisdictional area. Alignment SG-4 is the most southern crossing of all six alignments, while SG-1 and SG-5 are the northern-most crossing of all alignments. In addition, the wetland areas associated with Smuggler's Gulch within the project corridor are located in the mid- to northern portion of Smuggler's Gulch and thus unavoidable. The design of the preferred alignment (SG-1) was revised since the Draft EIS in an attempt to further reduce the impacts to WUS, including wetlands, as well as other sensitive habitats. The SG-1 alignment in the Draft EIS was reported to potentially impact 5.7 acres of jurisdictional WUS. As can be seen from Table 4-19, this alignment will now impact 4.3 acres, which is a 25 percent reduction.

Table 4-19. Permanent Impacts to Waters of the U.S. including Wetlands in Area V under the Proposed Action

Wetland type	Permanent				
	SG-1*	SG-2	SG-3	SG-4	SG-5
Mulefat Scrub	0.8	0.7	0.6	0.5	0.8
Southern Willow Scrub	0.5	0.7	0.5	0.5	0.9
Waters of the U.S	3.0	3.0	2.7	2.5	3.8
Total	4.3	4.4	3.8	3.5	5.5

* Preferred Alternative:

Most of the impacts would occur in Smuggler's Gulch. However, there are several ephemeral washes on Spooner's Mesa and the mesa east of Smuggler's Gulch (see figures 3-23 and 3-25) that contribute to these impacted areas. Impacts to jurisdictional wetlands would be associated with W2, W3, W4, and W5. Wetlands 2, 4, and 5 are southern willow scrub communities and W3 is a mulefat scrub community.

4.3.9.4.3 Area VI – Bunker Hill

As can be seen from Table 4-20, BHPO-2, and BHPO-3 would have the largest permanent impact (approximately 20.6 acres) on WUS, including wetlands, and BHPO-4 (preferred alignment), would have the least amount of permanent impacts (approximately 5.6 acres) on WUS, including wetlands. BHPO-1 would have similar permanent impacts to WUS, including wetlands (6.0 acres) as BHPO-4.

The Area VI alignments have the greatest variability relative to impacts to wetlands and waters. As mentioned above, alignments BHPO-2 and BHPO-3 would have the greatest magnitude of impacts on the wetlands in Area VI. Both of these alignments follow the right-of-way along Monument Road to Monument Mesa. Most (about 74 percent [15 acres]) of these effects would be to coastal salt marshes. However, approximately 50 percent (8.1 acres) of the impacts to coastal salt marshes would occur in previously disturbed areas. The quality and function values of the disturbed coastal salt marsh are very low. These areas have become filled with sediment from adjacent hillsides in Mexico, and non-native invasive species are competing with native vegetation, or many areas are void of vegetation. Under the preferred alignment (BHPO-4) the total impact to coastal salt marsh would be 2.7 acres, of which 2.4 acres (89 percent) is considered disturbed and of very low value. In fact, the National Oceanic and Atmospheric Association (NOAA) (2001) did not report these areas as coastal salt marsh at all; rather, it was reported as either ruderal or disturbed. It should be emphasized that the construction footprint would not encompass the entire acreage indicated for any alignment in Table 4-20. This amount includes the area that would be between the primary and secondary fences; INS has conceded that this area would be used for enforcement actions and thus has declared the entire area as "impacted." Temporary construction impacts associated with Area VI are presented in Table 4-21.

4.3.10 Socioeconomics

4.3.10.1 Area I

No impacts to population are expected from the implementation of any of the alignments in Area I. There would be a short-term influx of military personnel during the construction phase but all personnel are expected to leave once construction is complete. As a result, there would be no changes to the population or racial mix of the area. Military personnel would accomplish the construction so no increase in employment is anticipated. Short-term increases in income for local businesses are expected resulting from construction personnel purchasing items from the local area, temporary housing of construction personnel, and purchasing of materials for construction. A total of about 37 acres of fence and road platform construction is anticipated within Area I under the TCH-1 alternative. No residential or commercial structures are anticipated to be impacted from the implementation of this alternative within Area I. Furthermore, since there is no anticipated population increase, the demand for housing with Area I would not increase as a result of the implementation of alignment TCH-1 within Area I. Since construction is to take place away from residential areas, no impacts are expected to neighborhood cohesion.

Table 4-20. Permanent Impacts to Waters of the U.S. including Wetlands in Area VI under the Proposed Action

Wetland Type	Permanent			
	BHPO-1	BHPO-2	BHPO-3	BHPO-4*
Southern Willow Scrub	1.0	2.0	2.0	1.0
Mulefat Scrub	0.9	2.2	2.2	0.9
Coastal Salt Marsh	0.4	7.2	7.2	0.3
Disturbed Coastal Salt Marsh	2.7	8.1	8.1	2.4
Waters of the U.S.	0.1	0.1	0.1	0.1
Tamarisk Scrub	0.3	0.3	0.3	0.3
Disturbed Wetlands	0.6	0.7	0.7	0.6
Total	6.0	20.6	20.6	5.6

* Preferred alignment

Table 4-21. Temporary Construction Impacts to Waters of the U.S. including Wetlands in Area VI under the Preferred Alignment.

Wetland Type	Acres
Coastal Salt Marsh	0.19
Disturbed Coastal Salt Marsh	0.61
Disturbed Wetlands	0.09
Mulefat Scrub	0.36
Southern Willow Scrub	0.10
Total	1.35

The Border Infrastructure System would result in the reduction of illegal immigration and drug trafficking within this area. This would, in turn, reduce the crime and other societal costs associated with those activities. As illegal immigrants attempt to go around the infrastructure constructed in Areas I through VI, they would be forced into areas east of Area I. The terrain within these areas consists of large expanses of mountains and desert. Crossing in those areas is extremely dangerous and has resulted in numerous deaths in the last several years. Consequently, the proposed infrastructure construction could indirectly result in increased deaths of immigrants who attempt to illegally enter through those areas. However, it should be noted that numerous conditions such as natural catastrophic events (floods, earthquakes), economic degradation, and civil war, heavily influence the time and place where aliens attempt to illegally enter the United States.

Similar impacts would be expected regardless if other alignments had been selected. The only difference would be in the amount of land to be purchased, and thus removed from potential development. Alignment TCH-2 would require about 62 acres, TCH-3 would affect about 138 acres, and TCH-4, about 94 acres.

4.3.10.2 Area V

No impacts to population are expected from the implementation of any alignment within Area V. There would be a short-term influx of military personnel during the construction phase but all personnel are expected to leave once construction is complete. As a result, there would be no changes to the population or racial mix of the area. Military personnel would perform the construction, so no increase in employment is anticipated. Short-term increases in income for local businesses are expected, resulting from

construction personnel purchasing items from the local area, temporary housing of construction personnel, and purchasing of materials for construction. A total of 95 acres would be altered as a result of fence and road construction within Area V under the preferred alignment. No residential or commercial structures are anticipated to be impacted from the implementation of this alternative within Area V. Furthermore, since there is no anticipated population increase, the demand for housing with Area V would not increase as a result of the implementation of the Proposed Action Alternative. Since construction would occur away from residential areas, no impacts to neighborhood cohesion are anticipated as a result of implementing this alternative. A small area used for extractive industry (gravel mining) would be affected by this alternative. This would not have a significant impact to the economy of the area and would not result in a significant loss of jobs or other economic effects.

The fence and associated road construction would result in the reduction of illegal immigration and drug trafficking within this area. This would, in turn, reduce the crimes and other societal costs associated with those activities.

4.3.10.3 Area VI

No impacts are expected to population or racial mix within Area VI from the implementation of any of the alignments. There would be a short-term influx of military personnel associated with the construction of the fence and roads. This would create an indirect short-term economic benefit for the local community during construction, from construction personnel purchasing goods from the local community and providing temporary housing for construction personnel, to the purchase of construction materials. Approximately 33 acres would be utilized for construction of the fence and road platform under the preferred alignment (BHPO-4). No residential or commercial structures are anticipated to be impacted from the construction of the Border Infrastructure System by using this alignment. Furthermore, since no population increase or decrease is anticipated, no impact to housing would occur. The establishment of the Border Infrastructure System would allow the USBP to more effectively patrol the area. This would result in a decrease of illegal immigration and drug trafficking in the area along with the associated societal costs. Access to the Border Field State Park would vary according to alignment.

Under alignments BHPO-1 and BHPO-3, approximately 23 and 45 acres would be directly impacted from the Border Infrastructure System construction, respectively. Under these alignments, access to the picnic areas of Border Field State Park would be allowed but access to Friendship Circle, and the International Border Monument would be restricted. As a result, the populations north and south of the border would no longer be able to meet at Friendship Circle and pass messages across the border fence. This would result in negative impacts to the social structures of the families that use Friendship Circle to keep in contact with people on the other side of the border.

Under alignments BHPO-2 and BHPO-4 (preferred alignment), approximately 55 and 33 acres of land would be directly impacted, respectively, from the infrastructure construction. An aesthetically pleasing gate and fence (Section 5) would be provided at the existing road leading to Border Field State Park that would allow access to the picnic area, Friendship Circle and the International Border Monument. Thus, communications between people on both sides of the border would continue during normal park hours. Though the potential total acreage impacts are greater, no impacts to the social structures of these populations are anticipated under the preferred alignment. Various conceptual designs of fences and gates that have been proposed to the CDPR are contained in Appendix J.

4.3.10.4 Executive Order 12898, Environmental Justice

As indicated earlier in Section 3.10 of this EIS, the racial mix of the study area is predominantly Caucasian. More people claim Hispanic origin nearer to the international border and the population becomes predominantly Hispanic south of the border. No impacts to housing are anticipated from the implementation of any of the alignments in any of the areas (I, V, or VI). As a result, there would be no displacement of minority or low-income families. Thus, there would be no Environmental Justice impacts upon implementation of the Proposed Action Alternative.

4.3.10.5 Executive Order 13045, Protection of Children

EO 13045 requires each Federal agency "to identify and assess environmental health risks and safety risks that may disproportionately affect children"; and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This EO was prompted by the recognition that children still undergoing physiological growth and development are more sensitive to adverse environmental health and safety risks than adults. Implementation of any of the alignments under the Proposed Action Alternative would not result in disproportionately high or adverse environmental health or safety impacts to children on either side of the border. The construction would take place away from residential areas and would result in a decrease of traffic throughout the area, creating a safer environment for all children. Residential areas are located immediately on the south side of the border along the project corridor, however. The extant primary fence would prevent Mexican children from entering unsafe construction zones. Furthermore, on-site safety officers would monitor construction activities and take appropriate measures, including ceasing all construction, should a child happen to illegally enter the area.

Fugitive dust generated by construction activities could blow across the border into Mexico, thus creating transboundary impacts. As indicated earlier in Sections 4.2.8 and 4.3.8, however, these emissions are anticipated to be below *de minimus* thresholds and thus would not cause significant effects to Mexico's air quality and/or potential adverse effects to the health of the Mexican children living near the border. Therefore, the action would be in compliance with EO 12114, Environmental Effects Abroad of Major Federal Actions. In addition, the construction emissions would be temporary and the long-term emissions generated by the operation and maintenance of the Border Infrastructure System are expected to be less than there are presently. Furthermore, these alternatives would result in a reduction of illegal immigration, drug trafficking, and other crimes within the area, further making a safer living environment for children in the United States and Mexico.

4.3.11 Hazardous Substances

As discussed under Section 4.2.11, no hazardous substances or other environmental concerns were identified in Areas I, V, and VI; therefore, no effects from hazardous substances are expected upon implementation of this alternative. However, if unknown hazardous substances were identified during construction of the proposed project, the appropriate authorities would be immediately notified. During the construction phase of this project, secondary containment would be placed around any regulated fluid storage vessels kept on-site. In the event of a spill or leak, the appropriate authorities would be immediately notified and recommended clean-up procedures would be followed to remediate the spill/leak.

4.3.12 Noise

Potential noise effects that would result from implementation of this alternative would be similar to those discussed previously for the Tactically Optimum Alternative (Section 4.2.12). However, since the construction activities would be less, both in amount of earth moved and duration, under the Proposed Action, the magnitude of the effects would be reduced. The same mitigation measures and environmental designs discussed under Section 4.2.12 would be implemented under this alternative.

4.3.13 Aesthetic Resources

Using the preferred alignments under the Proposed Action Alternative, 35 acres would be permanently impacted in Area I, 95 acres in Area V, and 32 acres would be impacted in Area VI. Impacts to vegetation communities and wildlife habitat, and consequently to aesthetics within the area, are outlined in Section 4.3.4. Impacts to aesthetic resources in Area I would vary according to alignment, with TCH-1 resulting in the least amount of acres impacted (35 acres) followed by TCH-2 (62 acres), TCH-4 (94 acres), and TCH-3 (138 acres). The coastal sage scrub would be the community most affected within TCH-1, although most of it is considered disturbed communities. Vegetation impacts in Area V would be similar, regardless of the alignments chosen, and about 95 acres would be impacted. Of this, 45 percent is classified as disturbed and is considered to be of low aesthetic value. Within Area VI, the greatest impact to aesthetics would be from BHPO-2 (55 acres) followed by BHPO-3 (45 acres), BHPO-4 (32 acres), and BHPO-1 (23 acres). Access to the Border Field State Park would be restricted under BHPO-1 and BHPO-3, particularly Friendship Circle. Access would be allowed to Friendship Circle under BHPO-2 and BHPO-4 (the preferred alignment), though impacts to the viewshed from the fence structure would still occur. Under all alignments of this alternative, there would be some indirect benefits to aesthetics in communities north of the project area resulting from the reduction of illegal traffic, brush clearing, fires, and littering caused by illegal aliens.

4.4 CUMULATIVE EFFECTS

Cumulative impacts are impacts on the environment resulting from incremental impacts of the proposed action added to other past, present, and reasonably foreseeable future actions. Cumulative impacts associated with the proposed action are discussed in the following paragraphs.

In order to evaluate cumulative effects of the past and present projects in the region, other NEPA and California Environmental Quality Act (CEQA) documents from previous and current operations in the region. In addition, Caltrans, SANDAG, and the County of San Diego Planning Department were consulted in order to identify future projects in the region.

San Diego has historically experienced steady and significant growth. This trend continued in the past decade as population increased by over 12 percent and housing units increased by about 10 percent. Within the South Bay Region, which encompasses the project corridor, housing developments are anticipated to increase 179 percent in the next 15 years (SANDAG 2001). As population increases, the demand for other infrastructure and services, such as roads, stores, office buildings, and schools also increase. The following paragraphs describe the recent past, present, and future projects within the southern portion of San Diego County that could produce cumulative effects when combined with the Proposed Action Alternative.

4.4.1 Federal Projects

In addition to the border infrastructure construction that is ongoing or completed in Areas II, III, and IV, other Federal projects that have been recently completed or are proposed for implementation in the project vicinity include:

- Construction of the new USBP support facilities at Brown Field Airport
- Upgrade of the USIBWC International Water Pipeline, Otay Mesa
- Construction of sedimentation basins, Goat Canyon
- Implementation of the Model Marsh Project, Tijuana River Estuary
- Construction of the International Wastewater Treatment Plant, Tijuana River Valley
- INS site improvements, San Ysidro POE
- Implementation of USFWS Vernal Pool Stewardship Project
- East Otay POE
- Construction of a visitors' center at Monument Mesa and a research field station at Bunker Hill
- Repair and replacement of the ocean fence at Border Field State Park
- Installation of RVS towers
- Various USBP road improvements in east San Diego County
- USBP stations at Temecula and Chula Vista

The USBP support facilities at the Brown Field Airport impacted about 20 acres of previously disturbed grasslands. Construction of this facility also required remediation of lead-contaminated soils from an abandoned firing range. A 5-acre site, which contained a large population of Otay tarplant, was also conserved as mitigation. This site has since been designated as critical habitat for Otay tar plant.

The upgrade of the USIBWC International Pipeline would disturb about 0.10 acres of non-native grasslands. These impacts would be temporary, however.

The NOAA, CDPR, and SWIA are cooperating in a plan to construct sedimentation ponds in or near the mouth of Goat Canyon in Area V and VI. The purpose and intent of these ponds would be to capture sediments being transported from Mexico through Goat Canyon and into the Tijuana Estuary. Up to four different alternatives were considered in the planning process. The preferred alternative for this project would require clearing and grubbing about 42 acres of scrub habitat. The design and location of these ponds have also been incorporated in the planning of the INS's Border Infrastructure System to ensure there are no conflicts, and that the projects can operate in concert.

The USFWS is a cooperating agency with the California State Coastal Conservancy, SWIA, and the CDPR in a program to attempt to reestablish the hydrologic regime and vegetation communities within the Tijuana River estuary. The "Model Marsh" project includes removal of sedimentation from a 20-acre area near the mouth of the Tijuana River. The sediments are removed and placed in an abandoned quarry near the mouth of Goat Canyon. This project, therefore, serves a two-fold conservation purpose. Developed slopes at the reclaimed quarry have been revegetated; geofiber mats were placed on slopes greater than 2:1 to reduce erosion potential.

The USFWS also proposed to establish a Vernal Pools Stewardship Project in San Diego County. This program intended to set aside up to 8,220 acres in various parcels located near Del Mar, Miramar, Sweetwater Reservoir, Otay Reservoir, Otay Mesa, and Spring Canyon.

Construction of the USIBWC WWTP impacted about 75 acres of non-native grasslands and willow scrub communities. This project was completed in 1997 and was designed to provide secondary treatment of wastewater discharges from Mexico into the Tijuana River. Currently, however, the plant provides only advanced primary treatment.

The collection facility within Smuggler's Gulch and Goat Canyon are components of the USIBWC WWTP. Construction designs have been developed and incorporated to avoid conflicts with these systems.

The INS completed improvements to the traffic lanes and other appurtenant structures at the San Ysidro POE in 2001. Because the improvements were conducted in areas already developed, no impacts to the human or natural environment were incurred.

The U.S. Department of Justice and State of California are considering the possible construction of a new POE located approximately two miles east of the existing Otay Mesa POE. This proposal is in the very early stages of planning and no date for detailed analyses or construction design has been set as yet. The existing Border Infrastructure System in Area II would need to be incorporated to the design and operation of this new POE.

The TRNERR and CDPR are in the early planning stages of a proposed visitor center and a field research station at Border Field State Park. The visitor center is currently envisioned to be located near the base of Monument Mesa and the proposed research station site located on the western slope of Bunker Hill. There are no current estimates of the construction footprint of these two facilities, however, the INS is working closely with the proponents to identify alternative design and locations that would be compatible with the Border Infrastructure System and vice versa, including more aesthetically pleasing designs for the infrastructure system.

The USBP recently completed an EA for repair and replacement of the Ocean Fence at Border Field State Park. Approximately 465 ft of fence is scheduled to be replaced in FY 03. No additional habitat would be lost or altered. Provided construction is scheduled during 9 non-nesting season, no impacts to wildlife, including Federally protected species, would occur.

The San Diego Sector USBP is also currently planning to install 25 RVS towers during FY 03 and 04. Of these, 19 would be installed within the enforcement zone created by the Border Infrastructure System in Areas II, III, and IV. One would be located on the north side of the secondary fence, near Spring Canyon, but within the road/fence platform.

Of the six RVS sites proposed outside the Border Infrastructure System footprint, one would be located in a disturbed area (away from vernal pools) at the western end of Arnie's Point. The remaining five would be located on existing towers at Otay Mountain, Tecate Peak, Point Loma, Imperial Beach USBP Station, and Old USBP Sector Headquarters Facility. Consequently, no additional impacts are expected to occur from the installation and operation of these RVS systems. Up to 100 more RVS towers could be installed within the San Diego Sector over the next five years, including several associated with the Border Infrastructure System in Areas I, V, and VI. The towers would require disturbance of about 400 to 10,000 square ft each, depending upon the height and design/type of the tower.

The USBP Campo Station recently prepared NEPA documents for various road improvements in the San Ysidro Mountains and east of Campo, respectively. The Brown Field Station improvements consist of grading and surfacing about 10.5 miles of existing roads and up to 23 turnouts. No road widening or straightening is associated with the project. The Campo Station has proposed to construct three low water crossings, as part of ongoing road improvement projects, and about five miles of new road segments. The new segments are intended to be used for surveillance points in order to enhance the USBP's detection and apprehension efforts in these remote areas. This road construction would be expected to eliminate about 10 acres of sage scrub communities.

The San Diego Sector is planning construction of three new stations within the next year: Temecula, Chula Vista, and Campo. The facilities could impact up to 35 acres each. The EA for the Campo Station was completed in 2003. The EAs for the other two stations are ongoing.

4.4.2 State and Local Government Projects

In addition to the state and county agencies participating or cooperating in many of the projects described above, there are numerous projects that are being constructed, planned or recently completed by these agencies.

Local and state highway projects that are in various stages of planning or construction include extension of SR 125 South and Middle, widening of SR 54, extension of SR 11, and expansion of Highway 905 to Interstate status. Major developments that would be associated with these road improvements include, but are not limited to, the San Diego Mesa Industrial Park, U.S. Olympic Training Center, and Otay Ranch Business Park. Other related state and local governmental projects that are recently completed, ongoing or planned were presented in Table 4-22.

4.4.3 Private/Commercial Developments

Numerous private and commercial developments are planned, ongoing, and/or recently completed throughout the project region. As mentioned previously in this section, the Border Infrastructure System has substantially alleviated illegal alien and smuggling activities in Areas II and III. This enhanced security has allowed the Otay Mesa to become increasingly more developed. Some of the major developments that are being planned or constructed include West Otay Mesa, Telegraph Canyon Estates, Otay Ranch, and East Otay Mesa. Caltrans and Federal Highway Administration (2001) reported 26 planned developments that would impact over 10,000 acres in San Diego County. These included some of the projects described above for state and local governmental projects, since the projects would be a cooperative effort. One of the larger private developments includes a single-family residential area that is currently under construction north of the Spring Canyon.

A large shopping mall was also recently completed west of the San Ysidro POE as part of the International Gateway Complex. This project had little to no significant environmental impacts since it would be constructed entirely within developed areas according to the Presidential Permit (July 2001) and EA that was prepared for this facility.

Other proposed actions that have been discussed for the Otay Mesa area include the development of a gravel pit, a transboundary conveyor belt for aggregate material, and a racecar track. No definitive plans have been identified for any of these actions, however.

4.4.4 Cumulative Impacts of Alternatives

4.4.4.1 No Action

4.4.4.1.1 Direct Effects

Implementation of the No Action Alternative would not result in any additional direct effects to the human or natural environment. Approximately 170 acres of land has been permanently converted, impacting land use, cultural resources, threatened and endangered species, wetlands, vegetation communities, and geologic features. This action has also induced development north of the secondary fence, causing additional adverse impacts to the natural environment. Numerous private and public developments would continue under the No Action Alternative as areas like Otay Mesa continue to experience rapid development, as it has become one of the busiest land border crossings in the United States. Socioeconomic resources have benefited however, by the development from increased employment, sales, and property values and taxes.

Table 4-22.
Related State and Local Public Development Projects

Project Name	Type of Project	Year Construction Planned
Otay Mesa Road (OMR) Widening	Widening of OMR from four lanes to six between existing SR 905 and interim SR 905	Completed, in operation
SR 125	Completion of SR 125 between Route 905 and SR 94	2005
SR 125*	Completion of SR 125 between SR 54 to the Otay Mesa Border	2003
Route 11	Potential future connection between Route 905/SR 125 interchange and a future East Otay Mesa Border Crossing	>2015
Chula Vista/Interstate 805 Interchanges I-805/Telegraph Canyon Road I-805/Palomar Street I-805/Orange Avenue	 Interchange Improvements Development of New Interchange Interchange Improvements	 1998 >2000 2000-1
Otay Lakes Road/La Media Road	Regional Arterial Extension between Route 905 and Bonita Road	>2015
R.J. Donovan Prison Expansion	Expansion of State Prison	No Planned Date
Brown Field Master Plan	Potential future expansion and redevelopment of Brown Field	2001
Otay Valley Regional Park Focused Planning Area	Open Space/Recreational	No Planned Date
Pipeline 2000	Transmission Pipeline	Completed
Otay Mesa Pipeline Extension	Transmission Pipeline	1999
International Wastewater Treatment Plan	Wastewater Treatment Facility	Under Construction
Former Otay Corporate Center South Property	Biological Preserve	Created in 1998
U.S. Marshal's Seized Vehicle Storage Facility	31-acre Vehicle Storage Lot and Office Building	1998
Southbound Truck Route*	Major improvements to the existing southbound truck route	No planned date
SR 905*	The proposed freeway will connect I-5 and I-805	2007
Otay Mesa Higher Education Center*	38-acre facility	2004

Source: Caltrans and Federal Highway Commission, 2001; * Otay Mesa Chamber of Commerce, 2002

4.4.4.1.2 Indirect Effects

Some indirect benefits to natural resources have also derived as the illegal traffic is reduced or eliminated in more sensitive areas, such as Spring Canyon and Otay Mesa. There is a potential for increased traffic in Areas I, V, and VI where illegal immigrants would attempt to go around the current infrastructure in place within Areas II, III, and IV. Although this illegal traffic is unquantifiable at present, it would certainly have indirect adverse effects on the natural and cultural resources along the project corridor.

4.4.4.2 Tactically Optimum Alternative

4.4.4.2.1 Direct Effects

Implementation of the Tactically Optimum Alternative would result in about 479 acres being impacted over the entire 14-mile corridor. Sensitive resources that would be adversely affected by this alternative include about 29 acres of Waters of the U.S., including wetlands, four least Bell's vireos and their habitat, four coastal California gnatcatchers and their habitat, four vernal pools (all within Areas II and III) and the fairy shrimp they support, and about 70 acres of lands within the Border Field State Park and surrounding estuary.

The Tactically Optimum Alternative footprint could conflict with the proposed Goat Canyon sedimentation basins as well as the Border Field State Park visitors' center and field research station. If these projects were required to be relocated outside the Tactically Optimum Alternative footprint, additional acreage would be impacted. The USIBWC sewer collection facility at Smuggler's Gulch would also need to be avoided, which might result in additional acres impacted.

4.4.4.2.2 Indirect Effects

Indirect effects of constructing the Tactically Optimum Alternative would be both beneficial and adverse. As discussed previously, commercial and private developments would continue and possibly increase as the border region becomes more secure. This development could result in cumulative losses to wildlife habitat, productive soils, and unrecorded historic properties. The addition of the new infrastructure within the areas would provide more protection to the new residential and commercial activities moving into the area.

Some resources, such as the vernal pool complex on Arnie's Point, west of Cactus Road and the Tijuana River, would indirectly benefit due to the protection from illegal foot and vehicle traffic and the reduction in the USBP's enforcement footprint.

The MSCP has identified numerous areas adjacent to or in the vicinity of the project corridor that are planned for preservation. The purpose and intent of the MSCP is to preserve the more sensitive area or areas with higher quality habitat and allow other areas to become developed. Thus, there is a plan to control development within the county. If the MSCP is successful in achieving its acquisition and management goals, it should offset the losses being experienced along the border.

4.4.4.3 Proposed Action Alternative

4.4.4.3.1 Direct Effects

Implementation of the Proposed Action Alternative would have direct and indirect adverse impacts on the human and natural environments along the border. The infrastructure alignments would impact 162 acres, using the preferred alignments of TCH-1, SG-1, and BHPO-4. The cumulative direct effect of completion of the 14-mile Border Infrastructure System, therefore, would be the conversion/alteration of about 332 acres. Avoidance of the USIBWC collection facility in Smuggler's Gulch was taken into consideration during the preliminary designs of the proposed embankment. Therefore, no additional impacts would be anticipated to accommodate this facility.

Table 4-23 presents a summary of the impacts to vegetation communities, including those that would be associated with completion of the entire 14-mile infrastructure system, under the preferred alignment. The construction of the Border Infrastructure System to date has resulted in impacts to 1.31 acres of Waters of the U.S., including wetlands. These impacts have primarily occurred in Stewart's Creek (Area IV), Spring Canyon, Deadman's Creek (Area III), and Johnny Wolf Creek (Area II). Other unnamed drainages in Area IV and Area II have also been impacted. These impacts will be offset by creation and restoration activities that are ongoing in Spring Canyon, to ensure a no-net loss of wetlands.

Construction of the remaining segments of the Border Infrastructure System would result in the direct loss of less than 10 acres of Waters of the U.S. including wetlands. These losses would occur primarily in Smuggler's Gulch and the disturbed coastal salt marsh between Bunker Hill and Lichty Mesa. It should be emphasized, however, that not all of the lands between the primary and secondary fence would be impacted by the construction of the Border Infrastructure System. Given this, the cumulative effect of the impacts to wetlands would be less than 12 acres, all of which would be compensated at ratios ranging from 1:1 to 3:1 to ensure a no-net loss to these valuable resources. Furthermore, completion of the Border Infrastructure System in Area V will reduce the sedimentation that is currently generated within the project corridor by about 27 percent annually. This reduction will greatly benefit the riparian and coastal salt marsh communities downstream of the project corridor.

The Goat Canyon Sedimentation Basin project, discussed previously, would affect riparian communities within this drainage. Implementation of mitigation plans prepared for this project would compensate for the impacts at 2:1 and 3:1 ratios, ensuring a no-net loss of wetlands.

Public and commercial developments in Area I and II could affect additional Waters of the U.S., including wetlands with the exception of the upper reaches of Johnny Wolf Creek, riparian wetland communities are extremely limited; thus, most of the impacts that would occur would be to Waters of the U.S. Numerous vernal pool complexes occur on Otay Mesa and could be impacted by future development. However, such isolated wetlands are no longer considered to be jurisdictional wetlands under the CWA. They are afforded protection under California state laws and the ESA, if they are occupied by protected species or occur within designated critical habitat.

The completion of the Border Infrastructure System in Areas II, III, and IV affected one cultural site that was determined to be potentially eligible for inclusion of the NRHP. This site was located in the Spring Canyon area (Area III) and was tested and mitigated, in concurrence with the California SHPO. Another site located in spring Canyon is currently being tested/mitigated to allow the implementation of the wetlands mitigation plan to proceed. A total of 15 other cultural resources sites were recorded in the project corridor. However, none of these sites were determined to be eligible for inclusion to the NRHP (Cook and Pallette, 1994; Higgins, et. Al 1994; and Buysse and Largent, 1999).

4.4.4.3.2 Indirect Effects

Indirect, cumulative effects of the proposed action would be similar to those described in Section 4.4.4.2 above. With the construction of the new highway improvements and Otay Mesa POE, combined with the completion of the Border Infrastructure System, the vast majority of the undeveloped lands on Otay Mesa would be expected to be developed during the next 10 to 20 years. The only lands that would be expected to remain undeveloped would be the BLM lands within the San Ysidro Mountains, the public lands in Areas V and VI, and any MSCP lands or other mitigation lands that are set aside for preservation. Elimination of the illegal traffic through the MSCP lands would enhance the probability of success. Furthermore, as indicated later in Section 5, INS has

Table 4-23
Direct Potential Impacts of 14-mile San Diego Border Infrastructure System

	AREA						
Habitat Type	**I**	**II**	**III**	**IV**	**V**	**VI**	**Total**
Coastal Sage Scrub	7.9	.5			16.4	2.0	26.8
Disturbed Coastal Sage Scrub	6.2				2.5	0.6	9.3
Disturbed/Developed	9.2	9.9	65.3	31.1	42.4	13.6	171.5
Native Grasslands	13.8	10.9	4.7				29.4
Non-Native Grasslands		11.2					11.2
Vernal Pool							0
Waters of the U.S.	0.2				3.0		3.2
Maritime Succulent Scrub					3.7	9.4	13.1
Disturbed Maritime Succulent Scrub					0.1	0.7	0.8
Mulefat Scrub					2.2	2.0	4.2
Southern Willow Scrub			0.9	2.3	0.3	1.9	5.4
Coastal Salt Marsh						1.0	1.0
Disturbed Coastal Salt Marsh						0.5	0.5
Chaparral Scrub					9.0		9.0
Disturbed Southern Maritime Chaparral					0.2		0.2
Disturbed Wetlands		0.2					0.2
Non-Native Woodlands					0.3	0.5	0.8
Ruderal			27.0	5.8	12.2		45
Coastal Fore Dunes						0.2	0.2
TOTAL	37.3	32.7	97.9	39.2	92.3	32.4	331.8

plans to preserve or transfer approximately 145 acres to a willing resource agency(s) as mitigation for the project impacts. INS also intends to abandon and revegetate over 100 miles of roads that would no longer be needed upon completion of the Border Infrastructure System provided that permission from current landowners can be obtained. This action would result in an additional 145 acres of potential habitat within the next 10 years if the roads could be restored.

The increased infrastructure, as a result of the proposed action would in turn reduce illegal traffic within this area. As a result, there would be a decrease in criminal activity in that area. This would protect new residents and commercial activities.

4.5 RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM USE OF SOCIETY'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM ENVIRONMENTAL PRODUCTIVITY

Benefits derived from the control of illegal entrants and narcotics trafficking into the United States and the adverse impacts associated with the construction activities necessary to accomplish this control represent trade-offs between the local, short-term use and the long-term stability and productivity of society's environment. The proposed action would reduce the flow of illegal drugs and entrants to the United States, and consequently, reduce the social costs associated with managing these issues. Short-term, local adverse direct effects resulting from habitat disturbances would be off-set by long-term regional benefits, including protection from illegal vehicle and foot traffic, accidental fires caused by illegal entrants, lower costs to the country for health and emergency services, lower insurance rates for homeowners and businesses near the border, reduction in crime near the border, reduction in breaching and entering near the border, and illegal poaching.

The proposed action would require the conversion of about 332 acres, cumulatively, using the preferred alignments. Most of this acreage has been previously disturbed and does not provide suitable habitat for most wildlife populations. The long-term productivity of these lands would be lost over the life of the proposed project. INS would make every attempt practicable to avoid disturbances to valuable wildlife habitat (e.g., by using previously disturbed sites for staging areas). Compensation for these losses, if statutorily required, would be coordinated through the appropriate state and Federal resource agencies, as described in Chapter 5. Some impacts to threatened or endangered species would occur and must be mitigated to offset these losses, as required by Sections 7 and 9 of the ESA.

4.6 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN IMPLEMENTATION OF THE PROPOSED ACTION

The proposed action would result in the permanent conversion or loss of about 332 total acres of various habitats, mostly disturbed areas, non-native grasslands, and coastal sage scrub, to developed lands. These lands, including the disturbed areas, would be irretrievably lost regarding potential for inclusion to the MSCP, TRNERR, or any other conservation program. The proposed action would also require the irretrievable commitment of fuel, labor, building materials, and monetary resources.